INSTRUCTIONS

SINGER
KNITTING MACHINE
CARDMATIC-313

Congratulations on Your Purchase
of the New
SINGER Knitting machine
"CARDMATIC-313"

Before you start to knit on your SINGER Knitting Machine "CARDMATIC-313" we recommend you carefully read this Instruction Book. By using these easy to follow directions you will be able to take full advantage of the excellent performance of your machine. The beautiful creations on this machine are limited only by the imagination of the operator.

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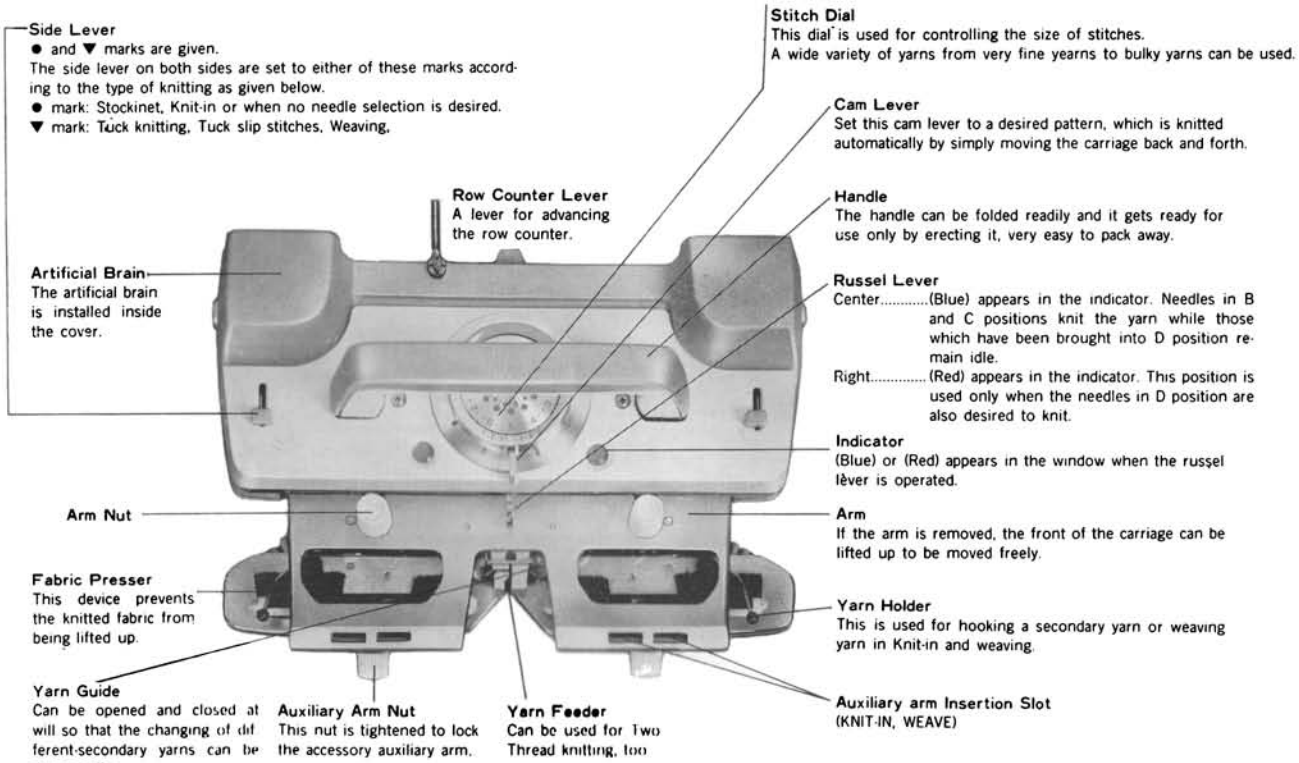
NAMES AND FUNCTIONS OF COMPONENT PARTS

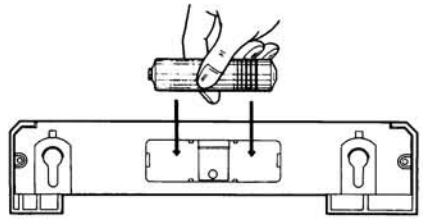
CARRIAGE


Side Lever
● and ▼ marks are given.
The side lever on both sides are set to either of these marks according to the type of knitting as given below.
● mark: Stockinet, Knit-in or when no needle selection is desired.
▼ mark: Tuck knitting, Tuck slip stitches, Weaving.
Stitch Dial
This dial is used for controlling the size of stitches.
A wide variety of yarns from very fine yearns to bulky yarns can be used.
Cam Lever
Set this cam lever to a desired pattern, which is knitted automatically by simply moving the carriage back and forth.
Row Counter Lever
A lever for advancing the row counter.
Handle
The handle can be folded readily and it gets ready for use only by erecting it, very easy to pack away.
Artificial Brain
The artificial brain is installed inside the cover.
Russel Lever
Center.....(Blue) appears in the indicator. Needles in B and C positions knit the yarn while those which have been brought into D position remain idle.
Right.....(Red) appears in the indicator. This position is used only when the needles in D position are also desired to knit.
Indicator
(Blue) or (Red) appears in the window when the russel lever is operated.
Arm Nut
Arm
If the arm is removed, the front of the carriage can be lifted up to be moved freely.
Fabric Presser
This device prevents the knitted fabric from being lifted up.
Yarn Holder
This is used for hooking a secondary yarn or weaving yarn in Knit-in and weaving.
Yarn Guide
Can be opened and closed at will so that the changing of different-secondary yarns can be done easily.
Auxiliary Arm Nut
This nut is tightened to lock the accessory auxiliary arm.
Yarn Feeder
Can be used for Two Thread knitting, too
Auxiliary arm Insertion Slot
(KNIT-IN, WEAVE)

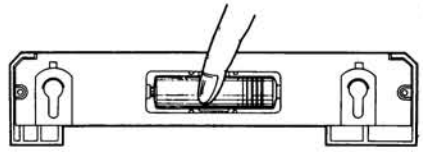
STOP BUZZER

* STOP Buzzer is used when pattern stitches are worked by setting it up on top of the Pattern Panel.
* STOP Buzzer is operated by a UM–3 Dry Cell.

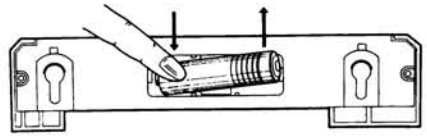
How to Place an electhic battery.



(1) Place the electric battery inside the hole at the bottom of the STOP Buzzer as illustrated.
* You may put it in either way.

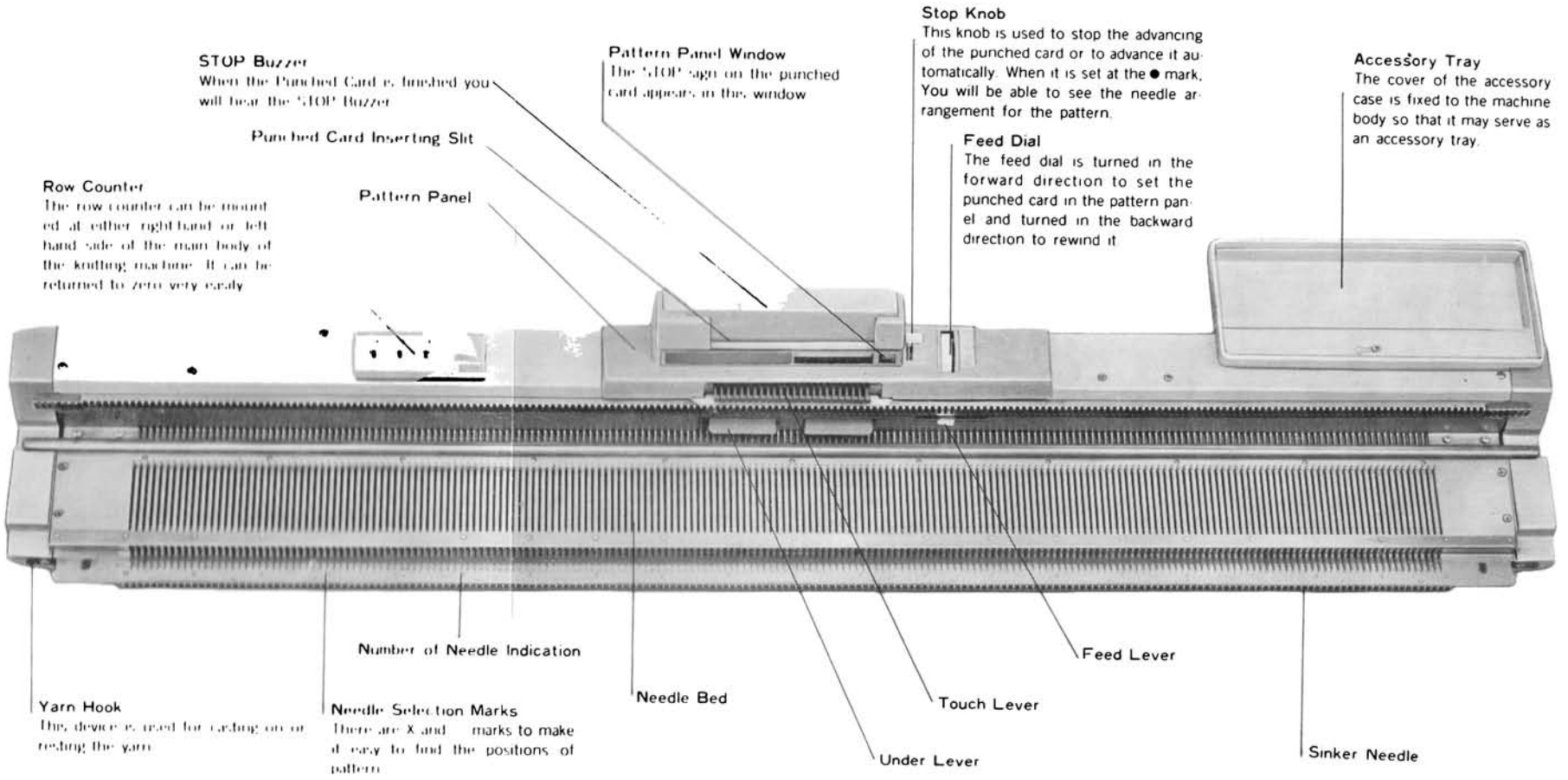


(2) Push in the battery as far as it will go.



(3) When you want to remove it, first press down at one end as illustrated.

MAIN BODY OF KNITTING MACHINE


STOP Buzzer
When the Punched Card is finished you will hear the 'STOP' Buzzer
Punched Card Inserting Slit
Row Counter
The row counter can be mounted at either right hand or left hand side of the main body of the knitting machine. It can be returned to zero very easily
Pattern Panel
Pattern Panel Window
The 'STOP' sign on the punched card appears in the window
Stop Knob
This knob is used to stop the advancing of the punched card or to advance it automatically. When it is set at the ● mark, You will be able to see the needle arrangement for the pattern.
Feed Dial
The feed dial is turned in the forward direction to set the punched card in the pattern panel and turned in the backward direction to rewind it
Accessory Tray
The cover of the accessory case is fixed to the machine body so that it may serve as an accessory tray.
Yarn Hook
This device is used for catching on or reeling the yarn
Needle Selection Marks
There are X and marks to make it easy to find the positions of pattern
Number of Needle Indication
Needle Bed
Under Lever
Touch Lever
Feed Lever
Sinker Needle

ACCESSORIES

Battery

Revelling Cord

Needle pusher

Transfer tools 1–2

2–3

1–3

Tappet

Weights

Auxiliary arms

Spare needles (3)
Tapestry needle
Crochet hook

Yarn rod

Auto tension

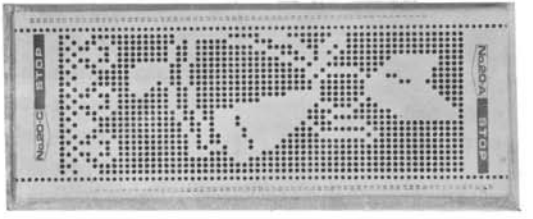
Tension guide

Oil

Carriage fastener

Brush

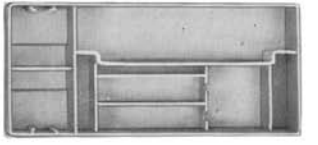
Stockinet card



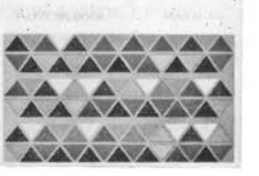
Punched card

Clamps

Accessory Holder

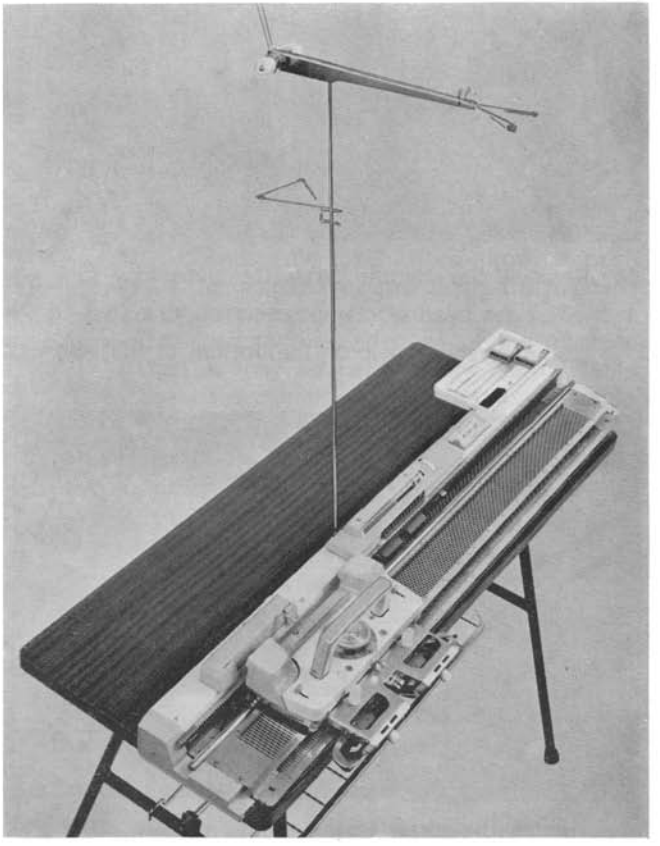


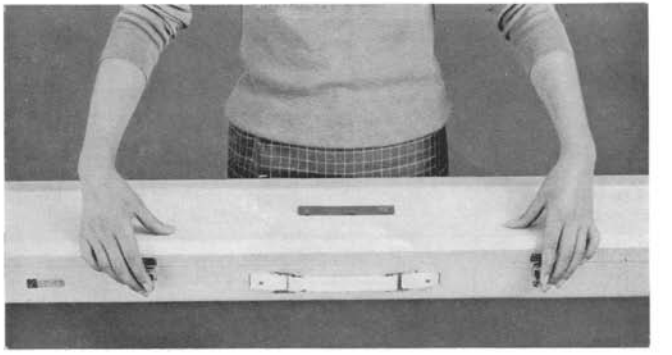
Accessory case



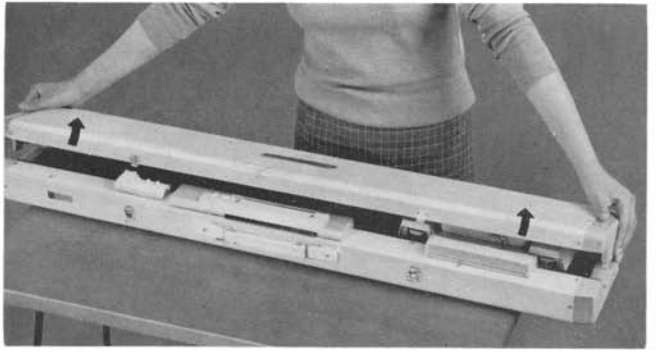
Pattern book

1. ASSEMBLING PROCEDURES

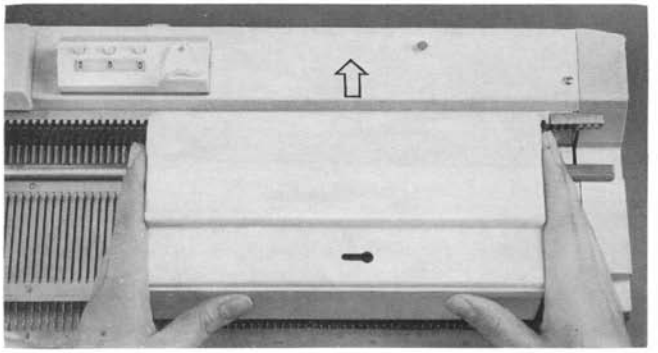




(1) Unfasten the latches.

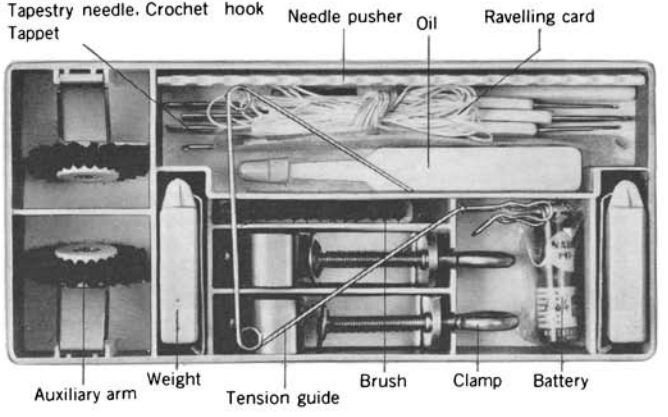


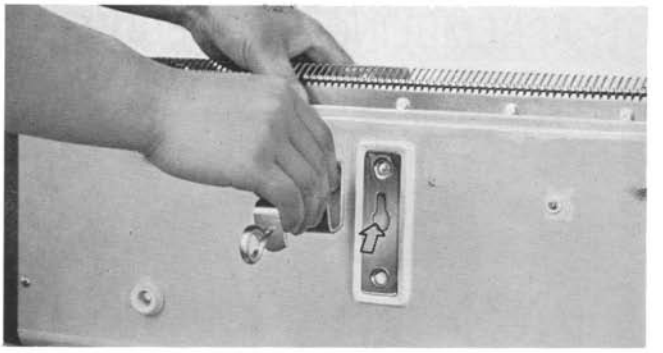
(2) To remove the cover, open it a little and pull it toward you.



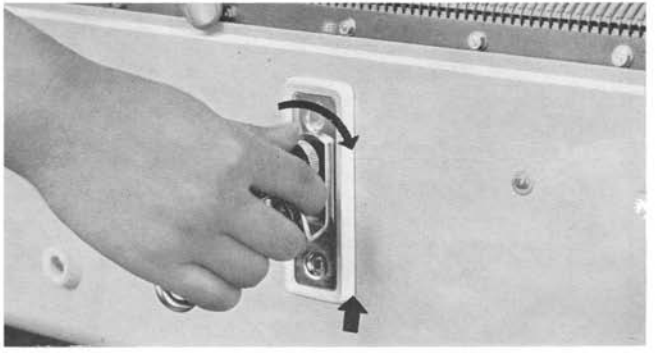
(3) Remove the accessory box.

ACCESSORIES
Transfer tool, 3 knitting needles
Tapestry needle, Crochet hook
Tappet

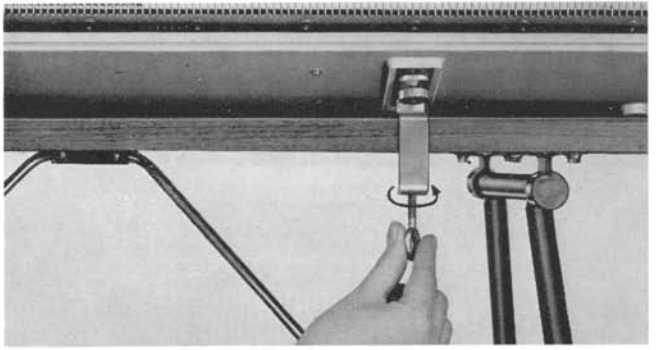




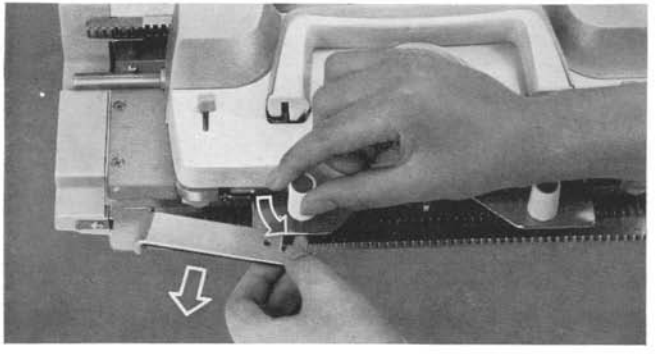
(4) Remove the clamps from the accessory box and insert the head of clamp screw in the center of the clamp receiving hole on the bottom of the machine.



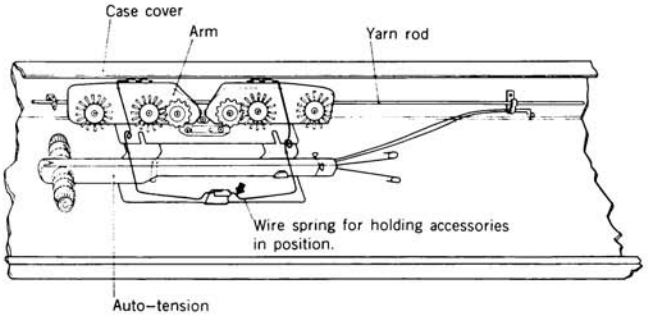
(5) Slide the clamp upward and tighten it firmly by turning the screw to the right.



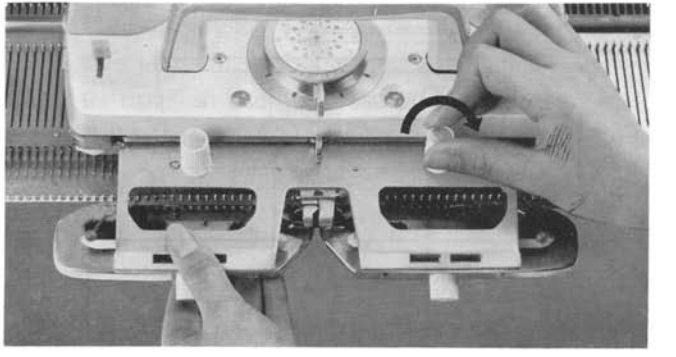
(6) After both clamps have been fixed firmly in position, fasten the clamp screws to clamp the machine securely to a table on which it is set. Rubber feet are provided on the underside of the machine case so that it may be held steady on the table without using the clamps. However, it is advisable to use the clamps when knitting heavy yarn.



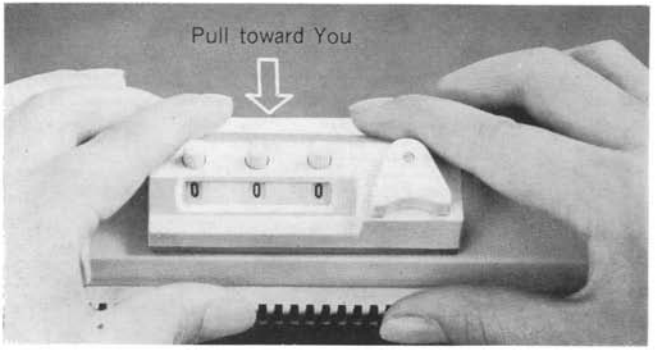
(7) Loosen the left arm nut and remove the carriage fastener.



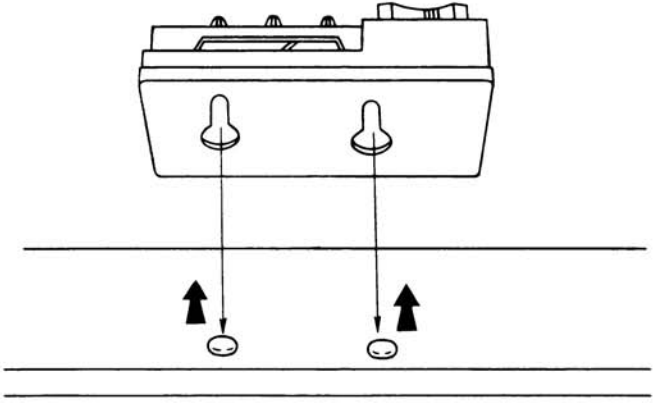
(8) Release the wire spring which holds the accessories in position inside the case cover and remove the carriage arm.

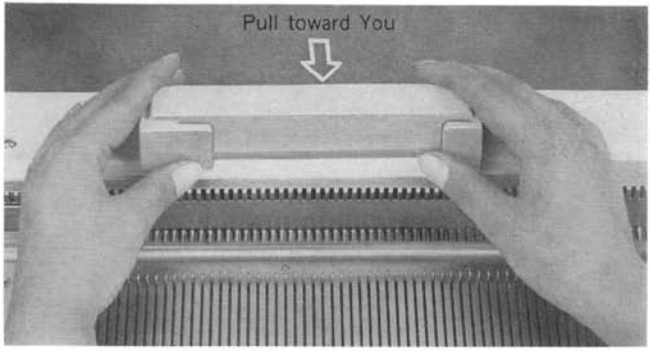


(9) Loosen the nuts on the carriage arm and push in the arm as far as it goes and tighten the nuts firmly.

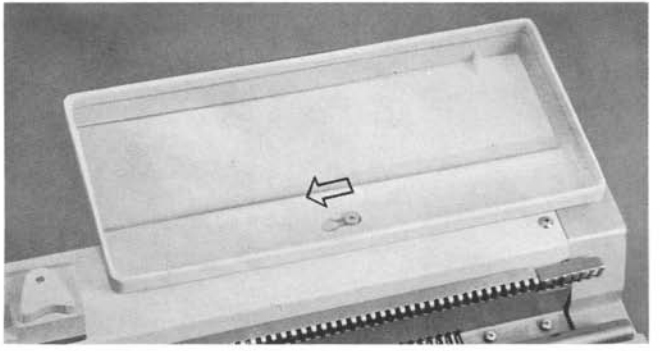


(10) Row Counter can be attached on either left or right side.



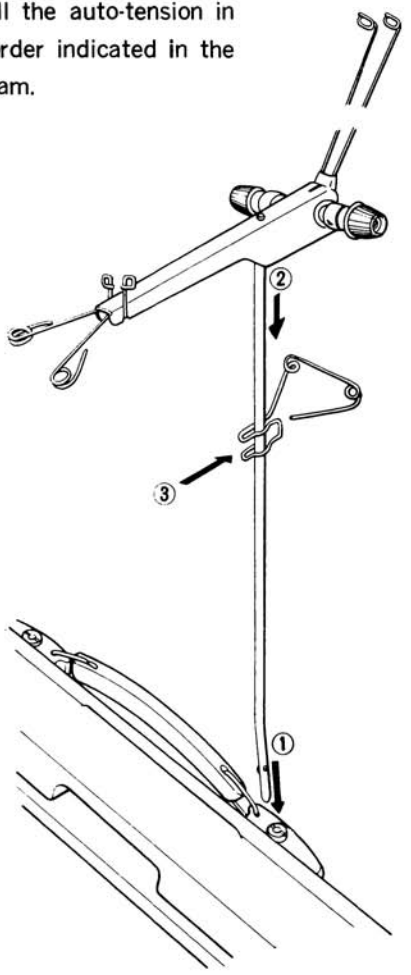


(11) When you want to attach Row Counter at left side, remove the STOP Buzzer.

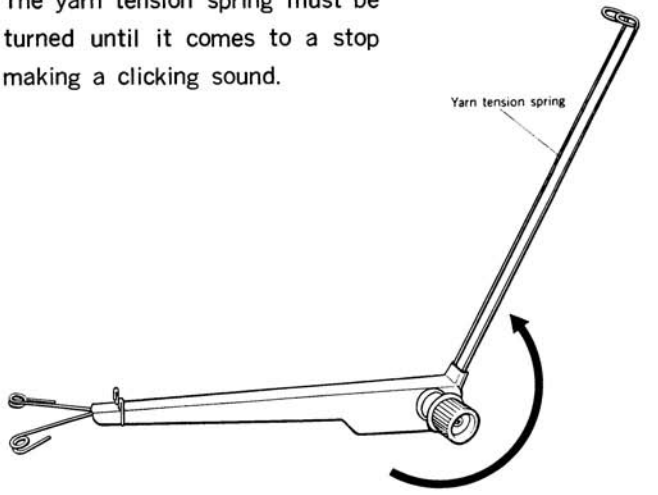


(12) Fix the rid of accessory box.

(13) Install the auto-tension in the order indicated in the diagram.

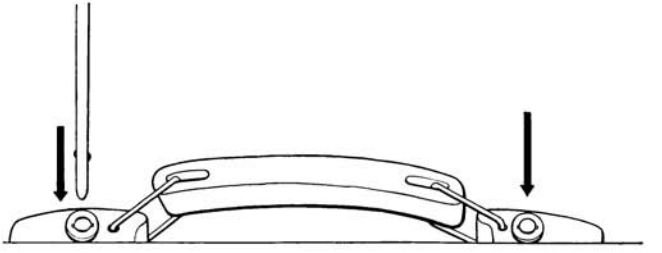


The yarn tension spring must be turned until it comes to a stop making a clicking sound.



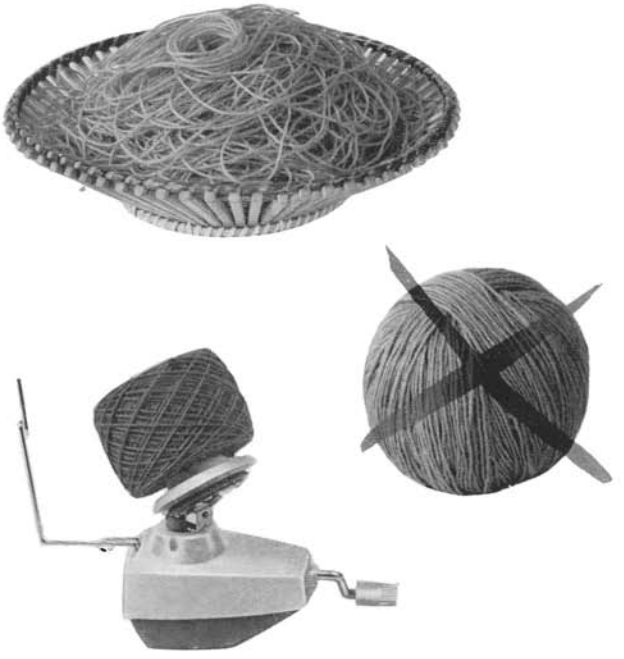
The auto-tension rod can be installed on either side of the handle on the case.

By using an additional set of auto-tension (sold individually), you can knit four yarns of different color at the same time.



2. PREPARATION FOR KNITTING

(1) Prepare yarns for knitting.

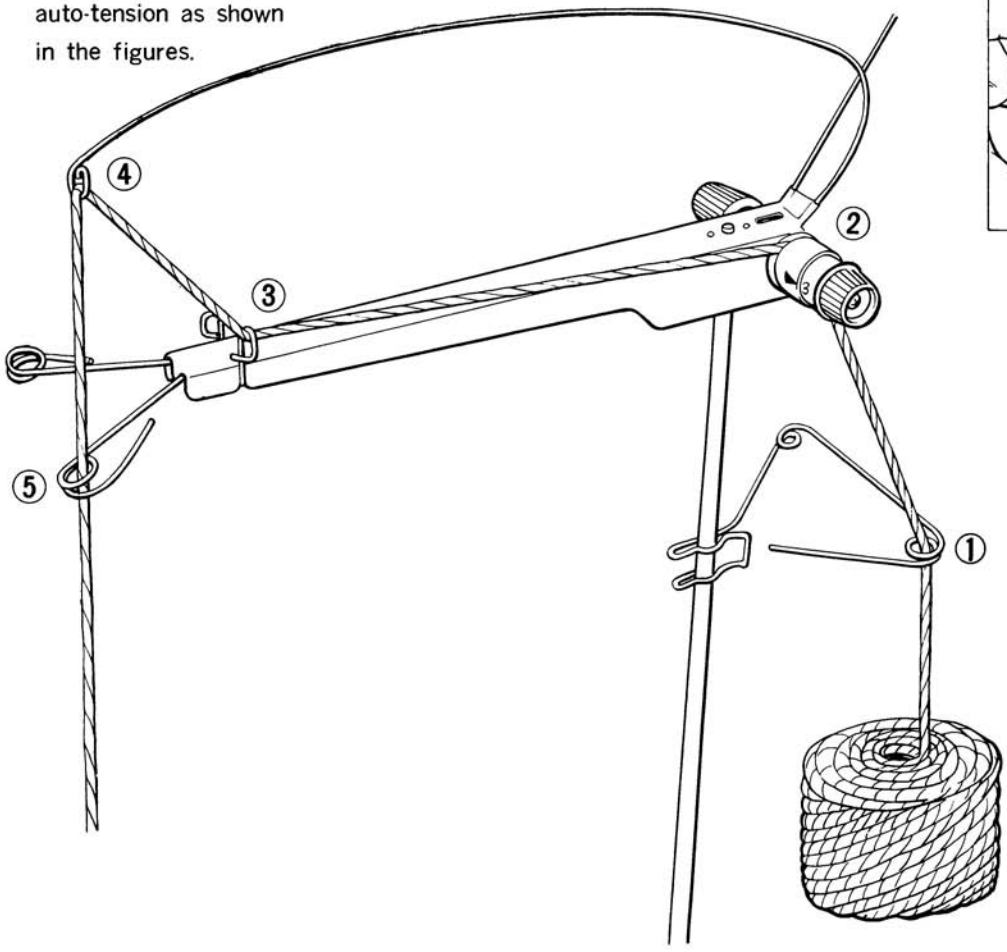


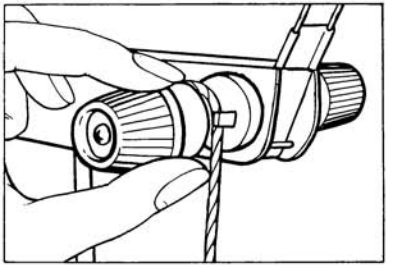
Note: The yarn must be placed well behind the machine so that it may not touch the carriage. If the yarn hangs loosely over the machine, it might get entangled in the "artificial brain". Care is needed to prevent this.

(2) Turn the tension dial to set the numerals to the ▼ mark according to the size of the yarn to be knitted.

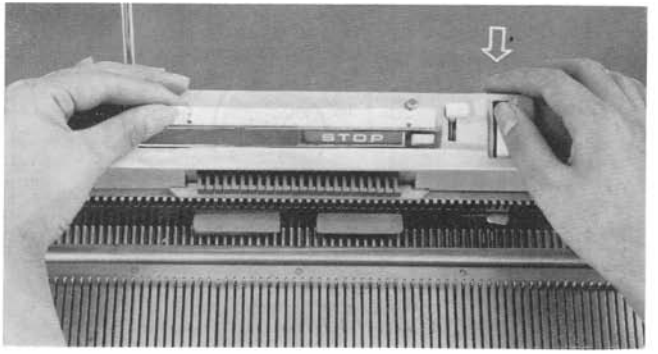
Yarn	Numeral
Thin yarns	5~4
Medium yarns	3
Thick yarns	2~1

(3) Thread the yarn through the auto-tension as shown in the figures.





* Make sure the yarn passes inside the pin.

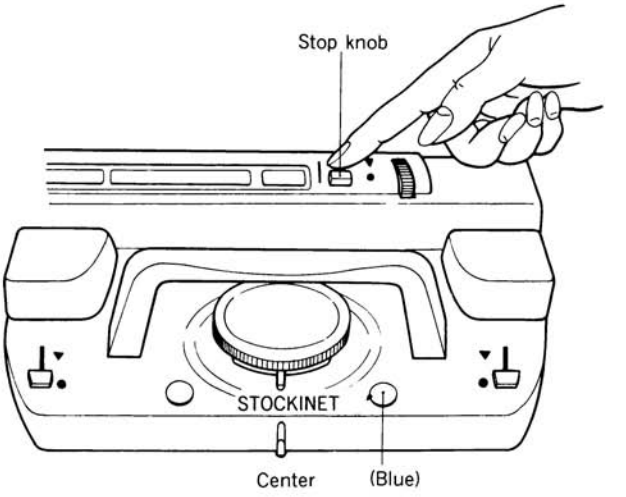


(4) Set the stockinet card in place.

* Set the stop knob to the ▼ mark and insert the stockinet card into the pattern panel.
* Turn the feed dial until STOP appears in the window on the pattern panel.

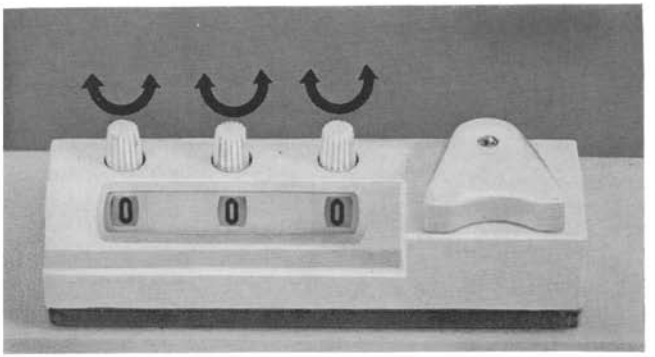
Note : * This card is used to facilitate the smooth movement of the carriage in knitting stockinet. It is not needed in pattern knitting or in knitting several rows of stockinet.

Move the stop knob fully to the ● mark. (Do not stop it halfway)



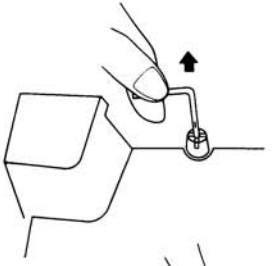
(5) Set the stop knob and the carriage as follows.

Stop knob	● mark
Cam lever	Stockinet
Stitch dial	5
Side levers	● mark
Russel lever	Center (Blue)

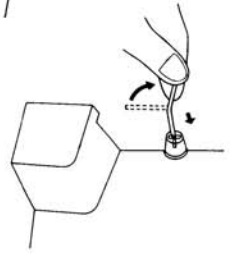


Adjusting the Row Counter

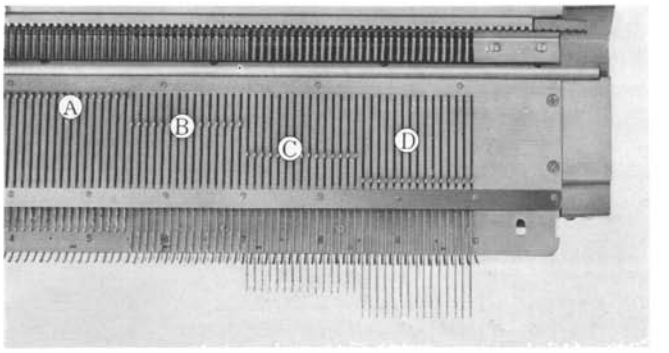
The row counter can be adjusted by turning the knobs on top in either direction.



(6) Lift the row counter lever upward.



(7) Turn the lever.
(Keep the lever turned inside when the row counter is not used.)



(8) Each end of the needle bed is marked with A, B, C and D, each accompanied with a mark (]), which indicate the positions of the latch needle.

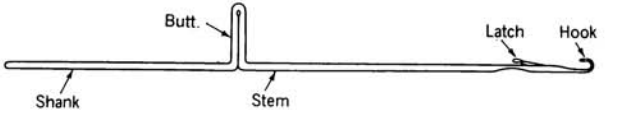
A Position .... Inoperative

B Position .... Normal stockinet knitting

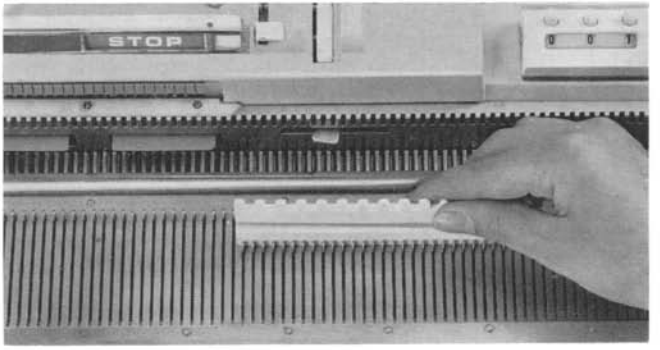
C Position .... Knit-in patterns and Partial knitting (for increasing stitches)

D Position .... Partial Knitting or selection of needles by hand.

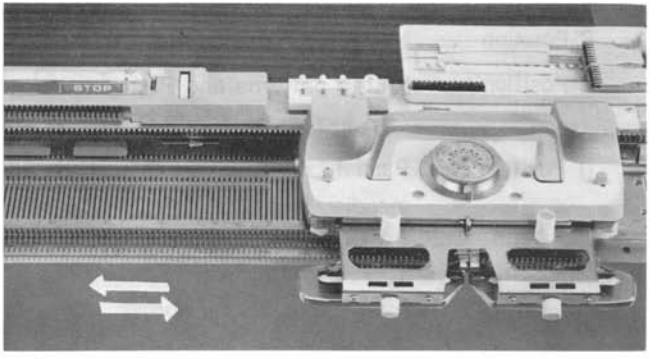
Latch needle



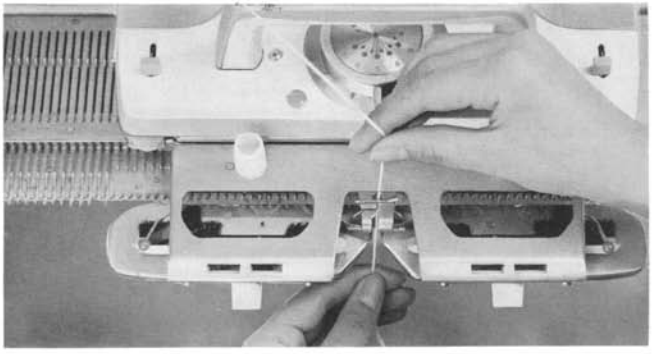
3. CASTING ON AND STOCKINET KNITTING



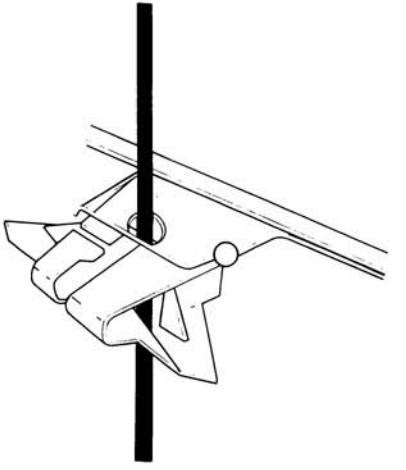
(1) Select the required number of latch needles to B position, using the smooth edge of the needle pusher.

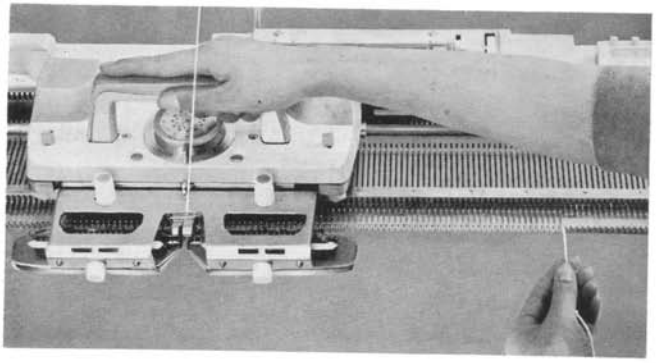


(2) Move the carriage slowly from side to side to line up the needles in B position. After that place the carriage to the right side.

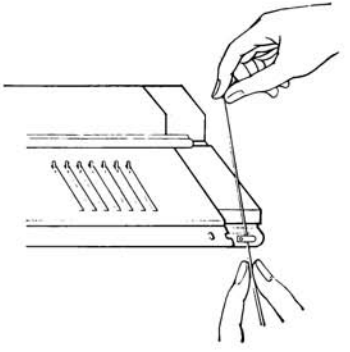


(3) Pass the yarn through the yarn feeder hole. (Let it come down 3 or 4 inches below the hole and hold it with one hand or anchor it with a clothepin.)

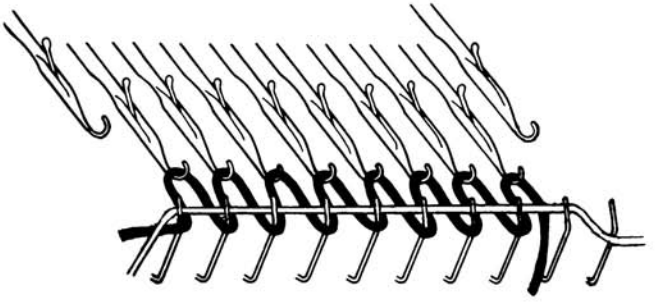




(4) Move the carriage slowly to the left and the yarn will be hooked by latch needles and sinker needles alternately.

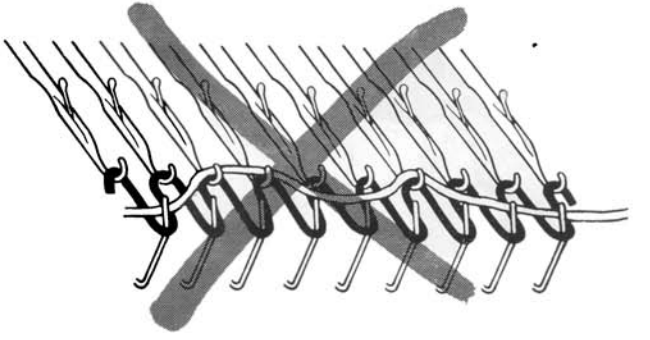


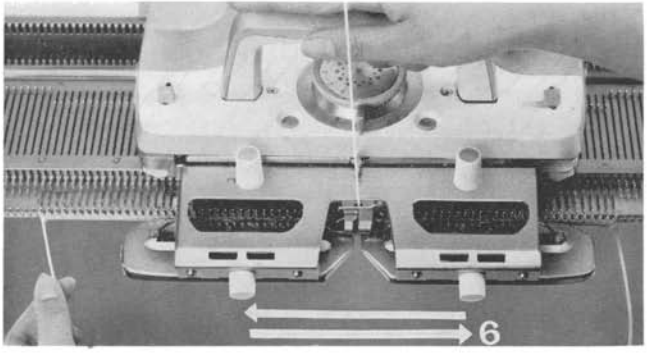
(5) Insert the ravelling cord in the right yarn hook which is located at the end of the machine. (There is a yarn hook at each end of the machine.)



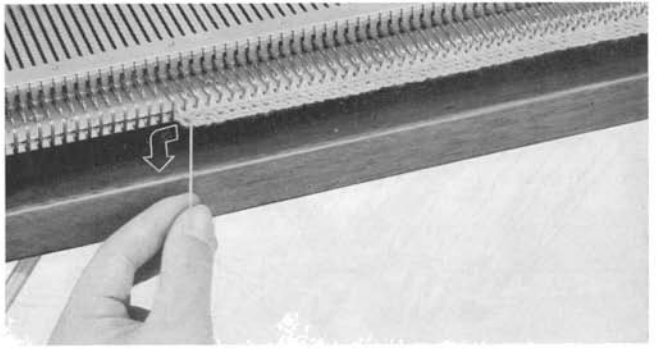
(6) Pass the ravelling cord over the knitting yarn which is hooked by latch needles and sinker needles.

(7) With your left hand pull the ravelling cord tight so that yarn will lay straight and enter between the sinker needles and the needle bed.





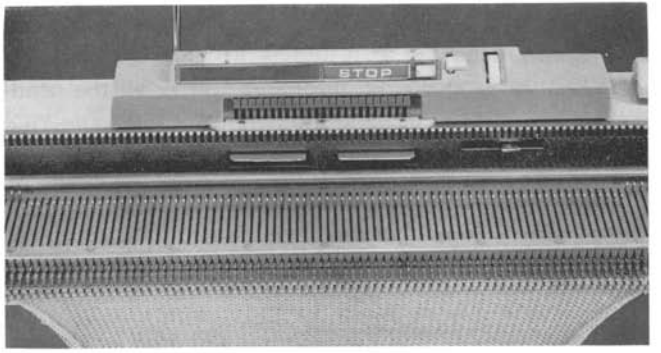
(8) While you are pulling the ravelling cord tight with your left hand, gently move the carriage back and forth to knit six rows. (The carriage must be on the left side of the needle bed at the end of this procedure if a pattern is to be knitted.)



(9) Remove the ravelling cord from the yarn hook and pull it out from the left hand side. Now the casting on procedure has been completed.

* Care should be taken not to make a knot in the ravelling cord.

* Tie an end of the ravelling cord to the accessory brush (passing it through a hole on the holder of the brush) and wind it around the groove when it is not in use.

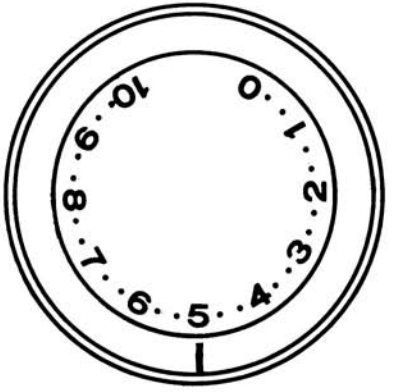


(10) Set the row counter to zero (0) and turn the row counter lever to the operating position. (Refer to "Adjusting the Row Counter" on Page 9.)

(11) Move the carriage back and forth for stockinet knitting. Operate the carriage evenly. It is not good to knit at the spead too fast or too slow, especially while it is passing in front of the pattern panel.

Note: When the carriage has jammed and its movement is prevented, do not try to move it by force. In this case, follow the instructions given on page 35 and repair the knitting.

Note: The carriage is to be returned after passing the end needle by 1 to 2 inches. Do not try to return the carriage in the middle of the bed.

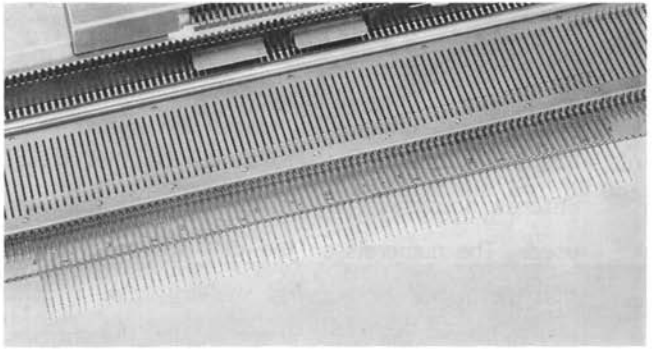


(12) The Stitch Dial is used to determine the size of stitches according to the thickness of the yarn used. The numerals on the dial are so arranged that the higher the numeral, the larger the stitches, and the lower the numeral the smaller the stitches.

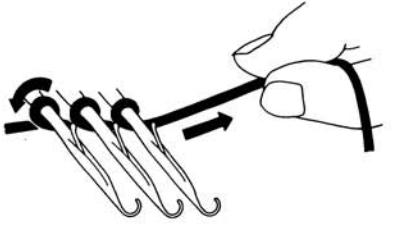
Size of yarn	Range of tension	Standard tension
Thin	0～ 3	2
Medium	3～ 6	5
Thick	6～ 9	8
Very thick	9～10	10

CASTING ON BY WINDING METHOD

* When you cast on by winding method, waste knitting is not necessary as you will have finished edge from the beginning. It is good for stoles, jumpers, etc. which are finished with fringes or decorative trimmings.

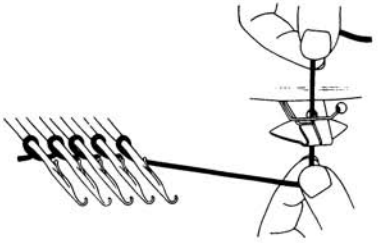


(1) Having the carriage on the right hand side of needle bed, bring out desired number of needles to D position.

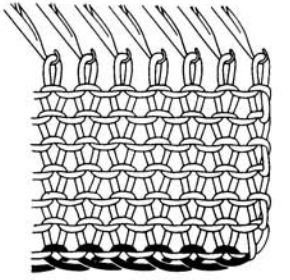


(2) Having the short end of knitting yarn at left hand, wrap around the yarn loosely at the stem of latch needles as shown by the figure. After all the needles have been wound, thread the feeder with the yarn. (Refer to the figure.)

Note: Be sure the winding will not be too tight, otherwise, it will be hard to knit the next row.

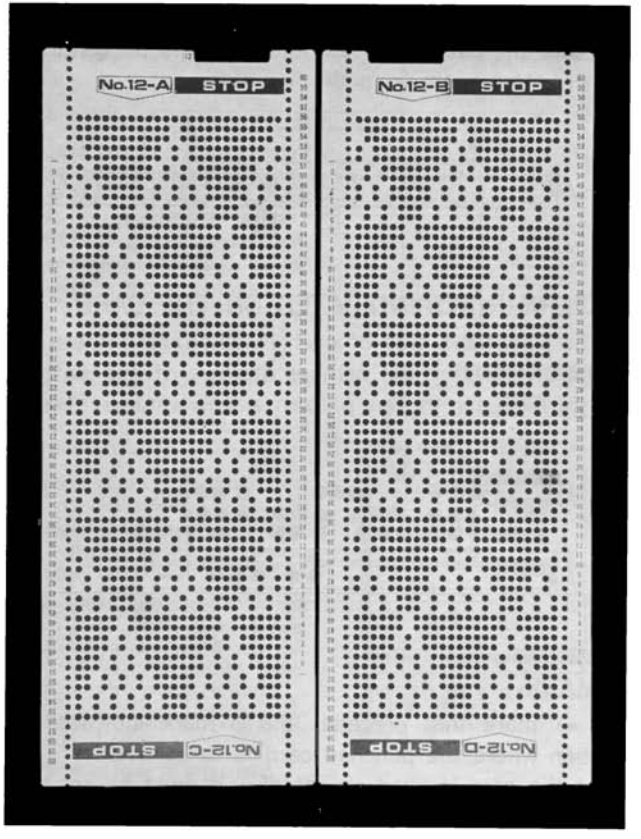


(3) Set the Russel lever to RIGHT and operate the carriage back and forth to knit stockinet stitches with permanent edge.



4. PATTERNED KNITTINGS

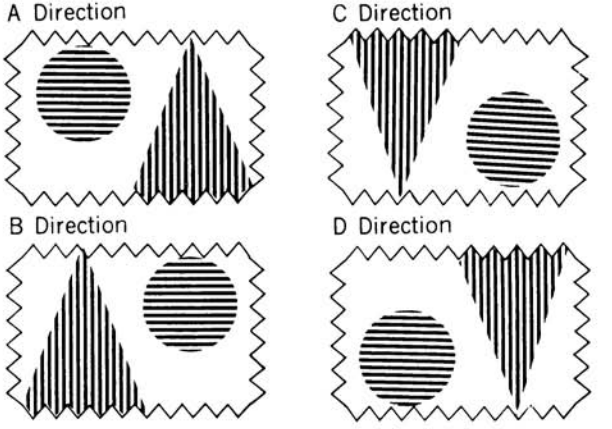
How to Read the Punched Card



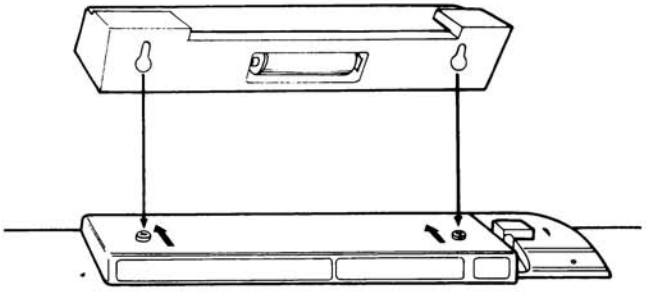
* The twenty punched cards (each representing a different pattern) that come with the knitting machine have serial numbers from No. 1 through No. 20 and alphabetical markings A, B, C and D respectively, for example, No.12–A.
  These markings help you in selecting the right punched card for a pattern you have picked up from the pattern book.
* When using a punched card, set the card in the pattern panel with the identification markings facing upward.

How to Use the Card Markings A, B, C and D

* A direction is basic pattern. By changing the direction, the pattern also changes its direction as shown in the figures below.



* How to Attach STOP Buzzer

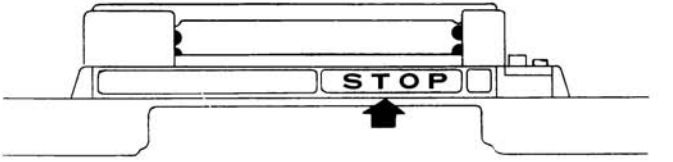


* Set STOP Buzzer on top of Pattern Panel as illustrated above.

Note: Do not try to remove STOP Buzzer while Punched Card is in.

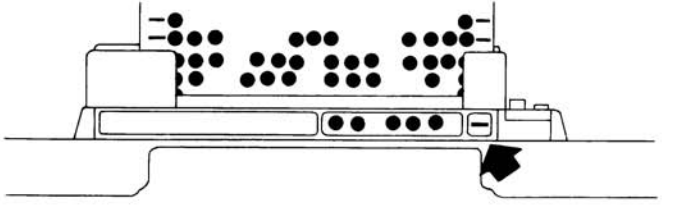
STOP

The STOP sign appearing in the pattern panel window indicates the end of the card. As soon as you hear the Buzzer, stop knitting and rewind the card back to ▬ mark. When the knitting operation is finished by using the card only once, knit a row at the ▬ mark position to complete the pattern. If the knitting is to be continued further, start again from the ▬ mark.



PATTERN ROWS INDICATED ON THE CARD

On the right-hand side of each punched card there are numbers indicating the number of rows of the pattern, and they appear in the pattern panel window at each row.



▬ MARK

The ▬ mark that precedes the 0 mark indicates the position where the punched card is to be set.
When the card is used repeatedly, it must be set back to this position before knitting operation is continued.

* PATTERN BOOK *

How to Read Operation Table
For pattern knitting, choose the desired pattern from the Pattern Book and operate the machine according to the instructions given in the operation table.

The number of rows which appear in the pattern panel window. Operate the machine in the order indicated by these numbers.

Whether you use only one color or two or more colors in your knitting work, use each yarn according to the given instructions.

Set the cam lever to a position indicated in this line.

Set the Russel lever of the carriage to a position indicated in this line.

Set the side lever to a position indicated in this column.

This is a preparatory stage before starting the pattern knitting. A row that is knit in this position is not counted in the number of rows. After completing the preparatory knitting of a row, proceed to the 0 mark, following the thick arrow mark.

CARD No. ⓘ—A ○○ KNITTING〈1〉

PAT. RS.	YARN	CAM LEV.	RUSSEL LEV.	SIDE LEV. (BOTH)	D. (RS.)
—	■	STOCKINET	(Blue)	▼	→
—	■	SLIP	(Blue)	▼	→
0	■	SLIP	(Blue)	▼	←
1	■	〃	〃	〃	→
2	■	〃	〃	〃	←
3	■	〃	〃	〃	→
4	*	〃	〃	〃	←
~					) (39)
42		〃	〃		←
STOP					

SET STOP KNOB TO ▼ MARK. 〈NEEDLE SELECTING〉

ONE PATTERN—24STITCHES AND 44ROWS.

This column shows the direction in which the carriage is to be moved and the number of rows to be knitted.

Return to this column when the punched card is used again. The last row in the card is knitted in this position.

The card advances to this column after completion of the preparatory knitting at the bar mark on the top. Here begins the pattern knitting operation.

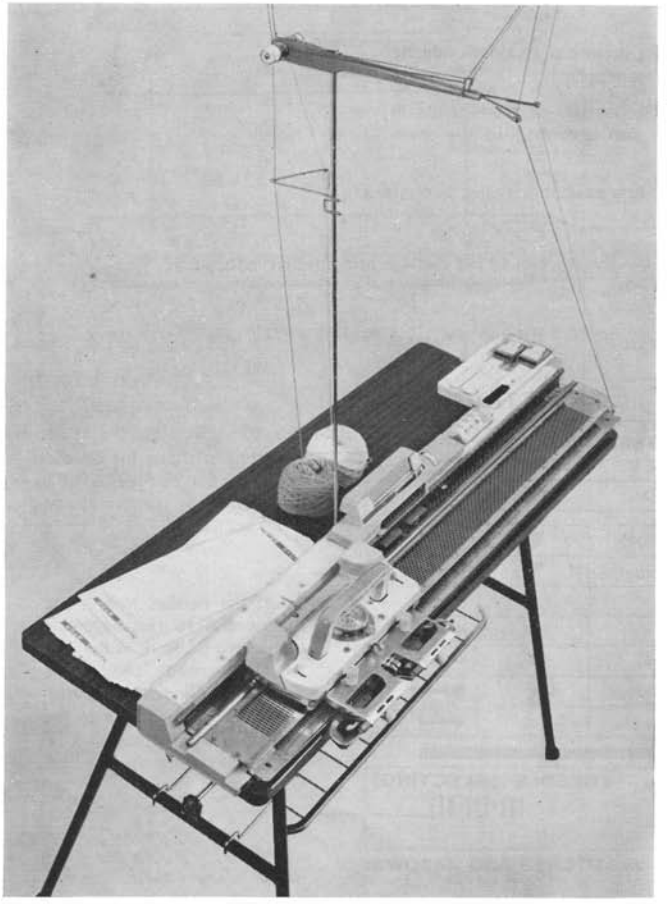
When STOP sign appears in the pattern panel window you will hear the Buzzer which warns you that the Punched Card is finished. There, rewind the card back to — mark.

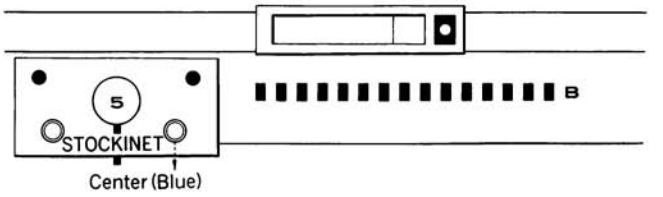
This symbol is used to signify the omission of repeated operations.

Set the stop lever to prescribed position.

Select the needles to knit and the needles to rest beginning at the zero (0) mark in the center of the needle bed. The circle dot (o) indicates the needles to be pushed back to the A position and the bar mark (I) the needles to be used.

Preparation for Knitting Pattern stitches



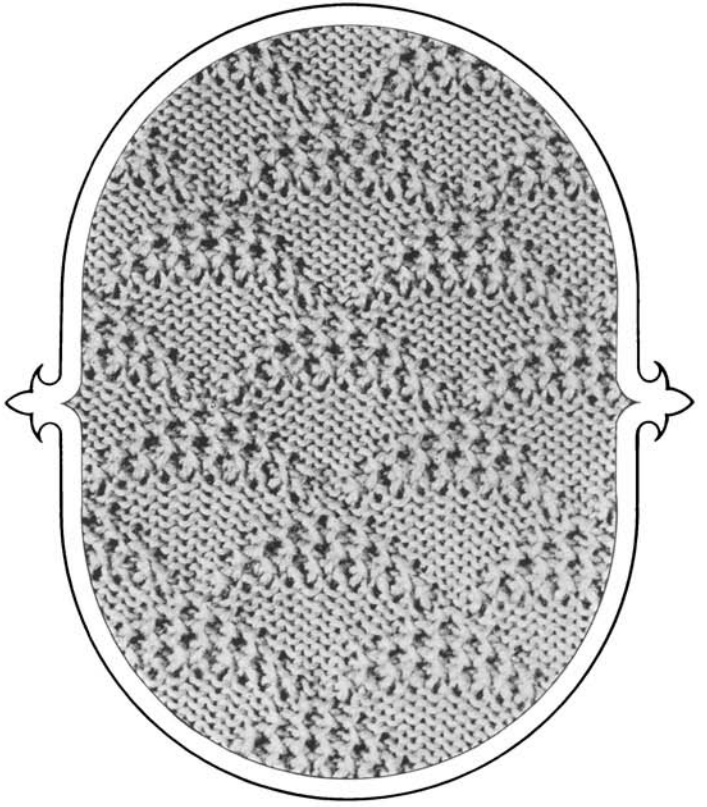


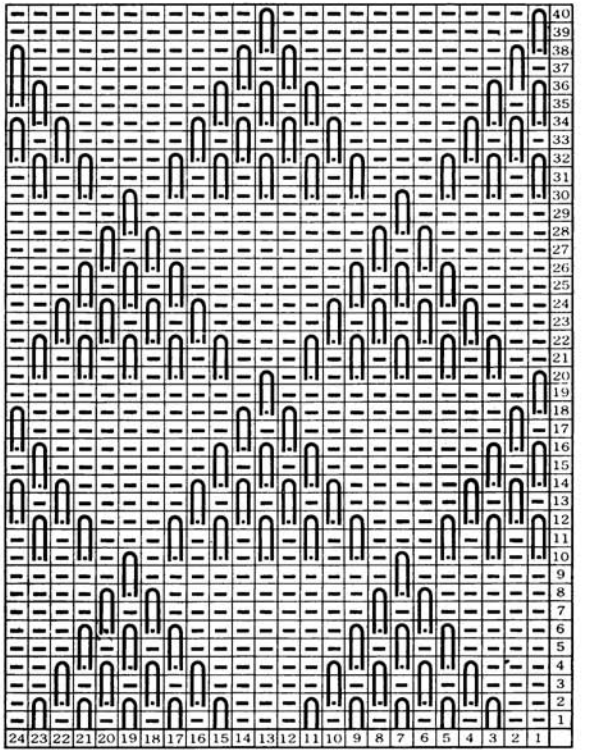
(1) Before practicing the pattern knitting, knit about seven or eight rows of stockinet and stop knitting with the carriage on the left side of the needle bed.

CAUTION

* Be careful not to pull the carriage out of the rail on the needle bed. (If you have accidentally pulled the carriage out of the rail, refer to the information given on page 40.)
* When you operate the carriage, move it in either direction until it passes the pattern panel.
* Move the carriage at an even rate.

TUCK KNITTING





Back loop of tuck stitch.

Back loop

Back loop of stockinet.

CARD No. 12 A TUCK KNITTING 〈I〉

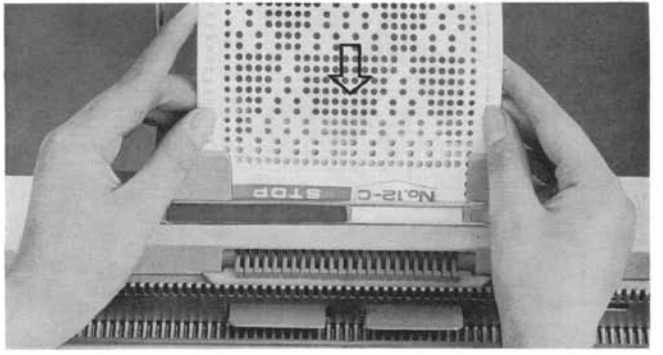
PAT. RS.	YARN	CAM LEV.	RUSSEL LEV.	SIDE LEV. (BOTH)	D. (RS.)
—	■	STOCKINET	(Blue)	▼	→
—	■	TUCK	(Blue)	▼	→
0	■	TUCK	(Blue)	▼	←
≀	■	〃	〃	〃	≀ (59)
58	■	〃	〃	〃	←
STOP					

SET STOP KNOB TO ▼ MARK.

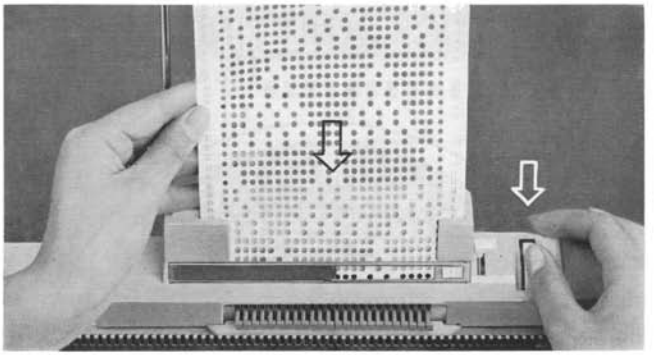
ONE PATTERN – 12 STITCHES AND 20 ROWS

Page 4 in the pattern book

To learn how to do the pattern knitting, carefully study the operation table. For practice, it is advisable to use a medium yarn.



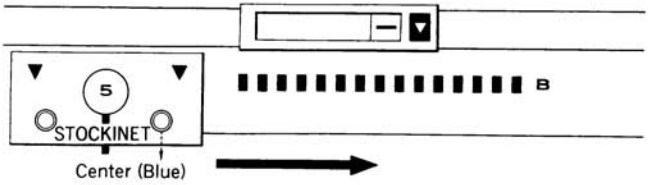
(1) Select No.12–A punched card and insert it through the slit in the pattern panel.



(2) Turn the feed dial forward until the ▬ mark appears in the pattern panel window.

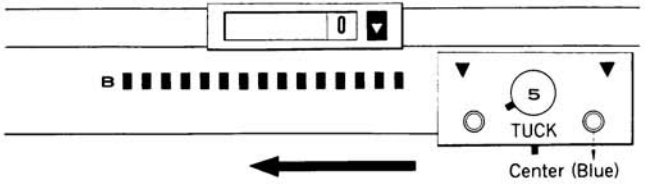
Note: * When inserting the punched card, be sure that it is not crooked nor folded.

* When the stop knob is set to the solid dot ● mark, the punched card will not move. Do not try to move punched card by force. When you want to turn the feed dial, first set the stop lever to the ▼ mark.

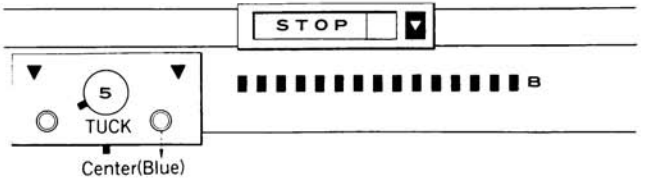


(3) Set each of the regulating parts of the carriage, following the upper ▬ mark (as indicated by the arrow) in the operation table. Knit a row by moving the carriage in the direction indicated by the arrow.

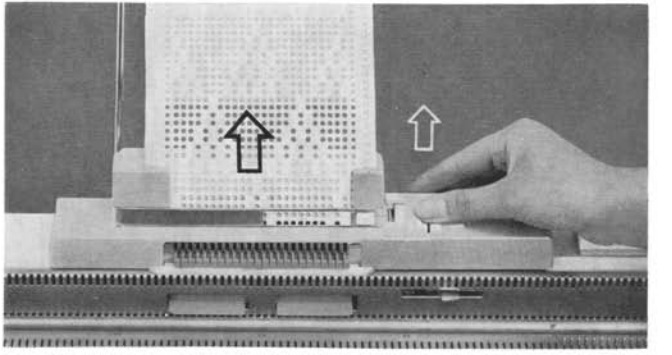
Note: This is a preparatory row before the beginning of pattern knitting and is not counted in the number of rows for the pattern knitting. When the pattern is knitted repeatedly, do not return to this column but to the ▬ mark indicated by the red arrow.



(4) One row has been knitted and the card is set at 0. Reset all regulating parts according to the instructions in the 0 column in the operation table.
Set the row counter to 0. Pattern knitting begins.



(5) Knit 59 rows by moving the carriage back and forth as indicated by the arrows, until STOP sign appears in the pattern panel window and you hear the Buzzer.

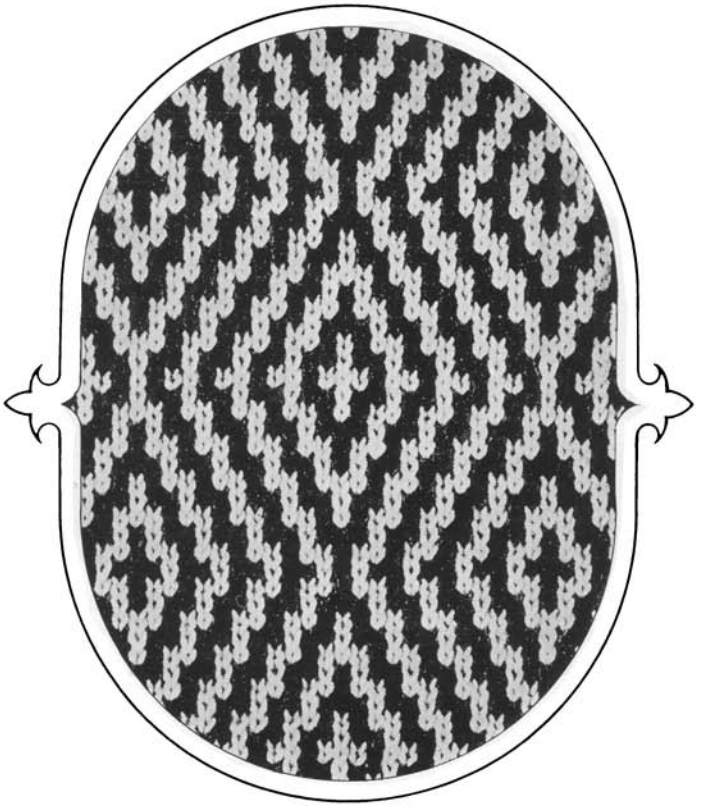


(6) Turn the feed dial backward to return the card to the ▬ mark. (The operation table shifts from STOP to the ▬ mark indicated by the red arrow.)

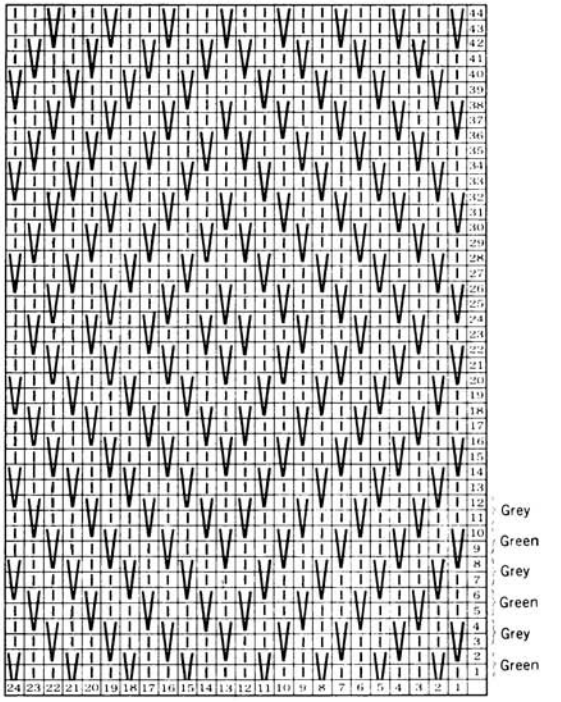
(7) Knit one row following instructions in the ▬ mark column.

(8) Repeat the process of advancing from 0 to STOP and back to the ▬ mark indicated by the red arrow for continuous design.

TUCK SLIP STITCHES

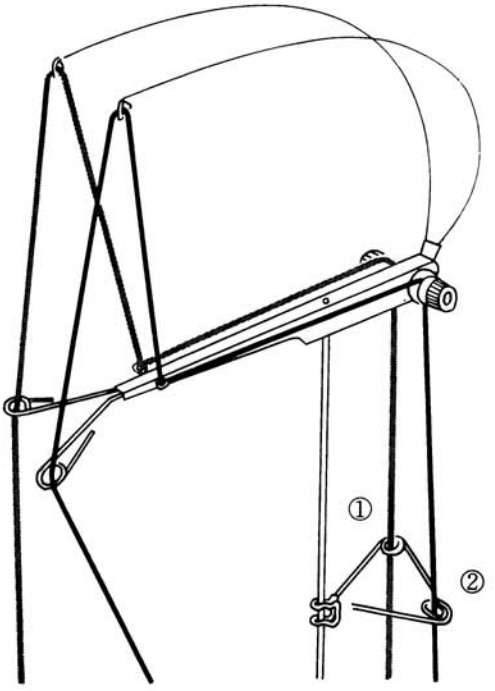


* Pattern Knitting Using Two Different Colored Yarns

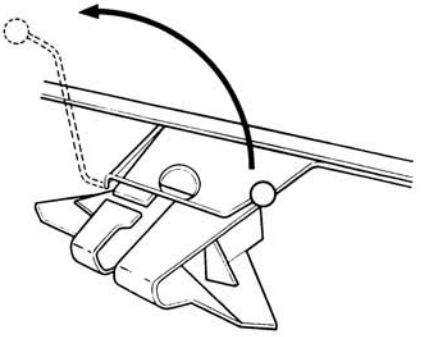


V Slip stitch
A loop in the lowest row is Pulled up with yarn lying behind it.

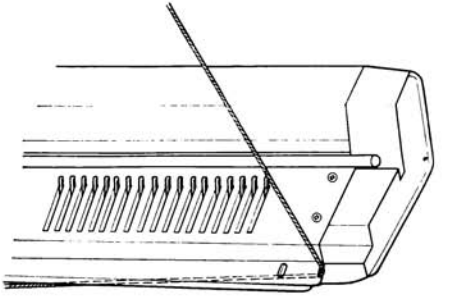
| Knit stitch
Face loop of stockinet.



* Thread the yarns through the auto-tension and hold them by inserting the ends in the yarn hook.
* The yarns must be passed through the loops of the tension guide as shown in the above figure.



* When two yarns are used, the knitting operation will be easier if the yarn guide is kept open.



* Rest the yarn not used at the yarn hook until the * mark appears to signal you to change the yarn. Be careful that the two yarns are not crossed each other.

CARD No. 18-A TUCK SLIP STITCHES〈1〉

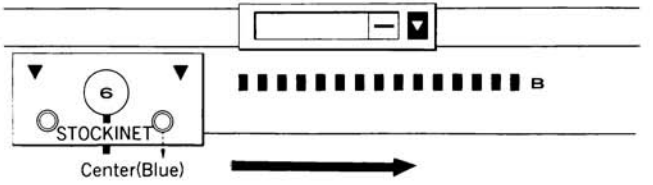
PAT. RS.	YARN	CAM LEV.	RUSSEL LEV.	SIDE LEV. (BOTH)	D. (RS.)
—	■	STOCKINET	(Blue)	▼	→
—	■	SLIP	(Blue)	▼	→
0	■	SLIP	(Blue)	▼	←
1	■	〃	〃	〃	→
2	■	〃	〃	〃	←
3	■	〃	〃	〃	→
4 ~ 42	*	〃	〃	〃	← (39)
STOP					

SET STOP KNOB TO ▼ MARK.
• Change color every second row.

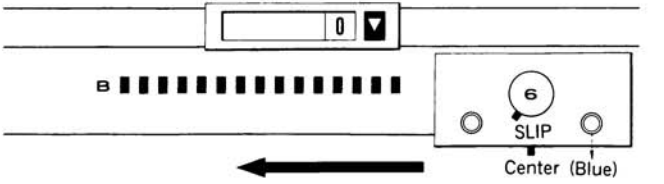
ONE PATTERN-24STITCHES AND 4 ROWS

Page 21 in the pattern book.

(1) Insert Punched Card No. 18-A through the Punched Card Insertion Slit.



(2) Set the card at the — mark and knit one row using grey yarn in the direction of the arrow.
(This is a preparatory step before starting pattern knitting.)



(3) Set the carriage according to the instructions for the 0 row given in the operation table.

(4) Switch to green yarn and knit two rows (at 0 and 1 on the card memory).

(5) Switch back to grey yarn and knit two rows (at 2 and 3 on the card memory).

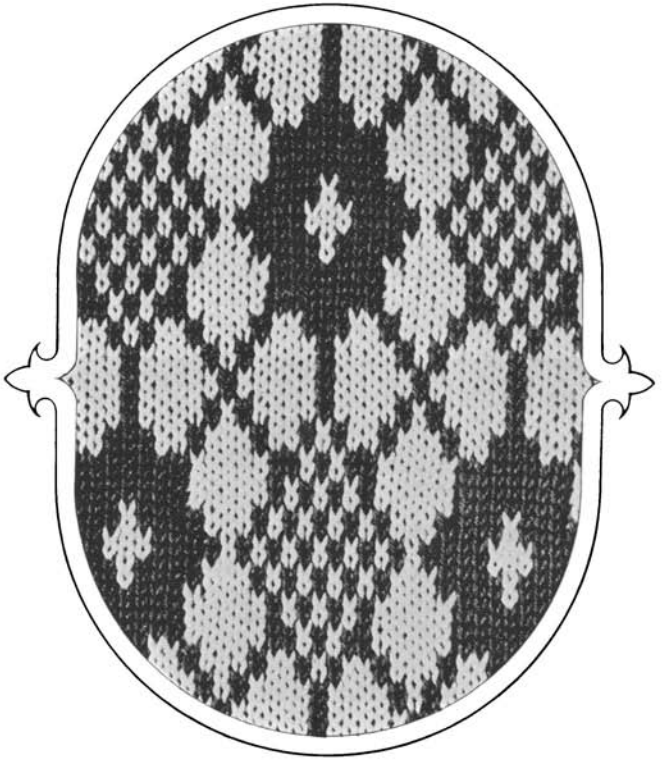
(6) From the * mark on, continue to knit in pattern stitches, changing the color every 3rd row until STOP sign appears in the pattern panel window and you will hear the Buzzer.

(7) Turn the feed dial to return the card back to the — mark indicated by red arrow.

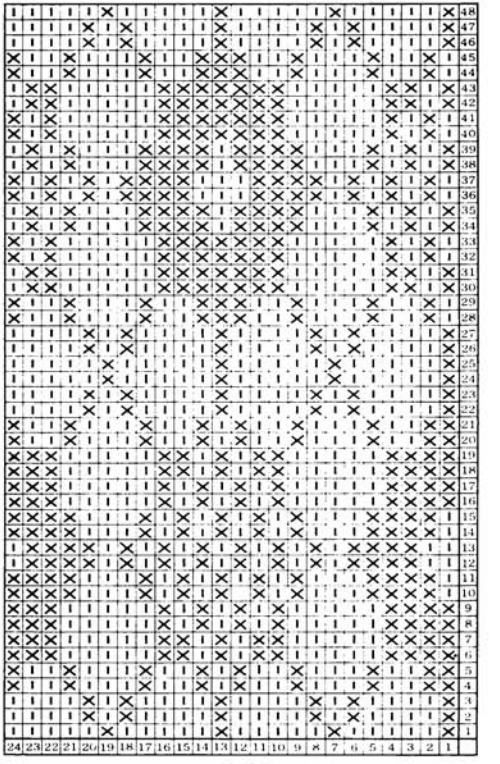
(8) Knit one row following the instructions for the — mark row indicated by the red arrow.

(9) Repeat the instructions from 0 to STOP and back to the — mark.

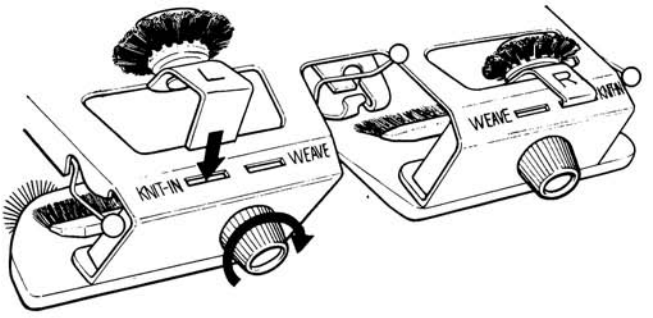
KNIT-IN



* This is a method in which two different colored yarns are knitted together at a time.
* The main yarn is passed through the yarn feeder and the contrasting yarn is hooked on the yarn holder.



(I) The main yarn
(X) The secondary yarn



(1) On both sides of carriage arm install the auxiliary arms in the slots (KNIT-IN), push them in as far as possible, and tighten the screws firmly.

(2) Thread the two different colored yarns through the auto-tension.

* Insert the contrasting yarn into the yarn hook and pass the other yarn through the yarn feeder.

CARD No. 15 - A KNIT - IN〈2〉

PAT. RS.	YARN 2nd / MAIN	CAM LEV.	RUSSEL LEV.	SIDE LEV. (BOTH)	D. (RS.)
		KNIT-IN 1	(Blue)	●	→
		KNIT-IN 2	(Blue)	●	→
0		KNIT-IN 2	(Blue)	●	←
≀		〃	〃	〃	≀ (47)
46		〃	〃	〃	←
STOP					

SET STOP KNOB TO ▼ MARK.

ONE PATTERN–24STITCHES AND 48ROWS

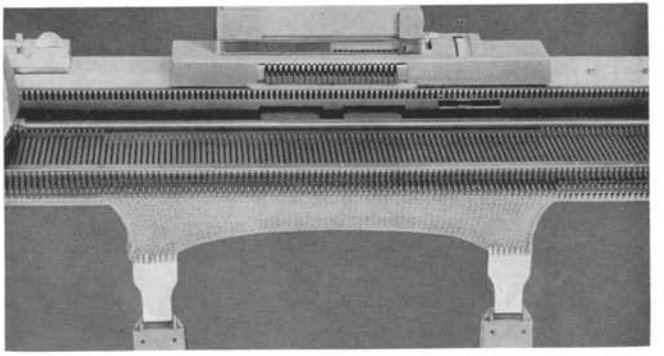
Page 33 in the pattern book

(3) In the knit-in operation, the knitting needles always come out to the C position. (The stitches never go beyond the latches.)

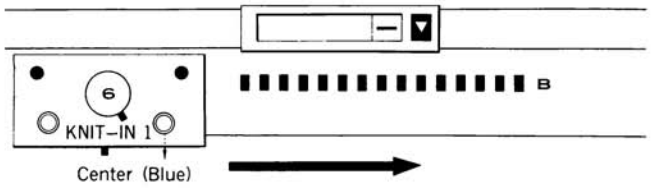
Cam lever

Knit-in 1 . . . Knitting needles line up in the C position after knitting stockinet irrespective of the pattern instructed by the punched card inserted in pattern panel.

Knit-in 2 . . . Cam lever must be set to 2 before starting pattern knitting. Latch needles line up in the C position while knitting the instructed pattern.

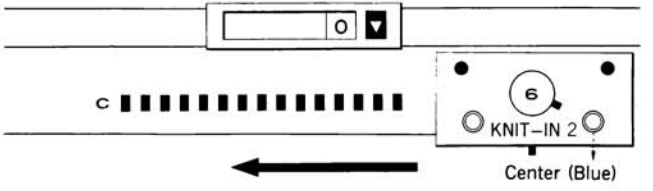


(4) In the beginning, knit several rows of stockinet and stop the carriage on the left side of the needle bed. Attach the accessory weights to both ends of the knitted piece.



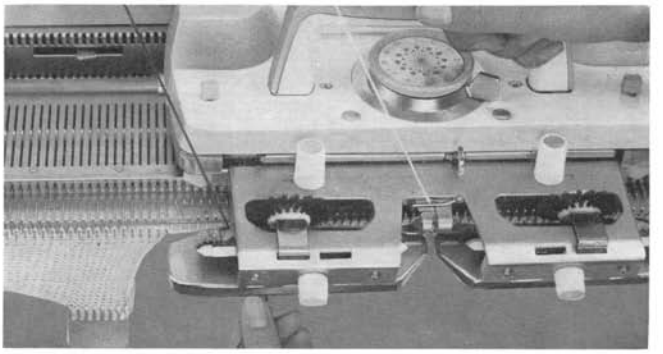
(1) Insert the punched card No.15–A in the pattern panel. Set the carriage, following instructions for the upper ▬ mark. (KNIT–IN 1)

(2) Knit one row in the direction of the arrow with the yarn coming through the yarn feeder. One row of stockinet stitches has been knitted and the needles line up in the C position.



(3) Set the carriage, following the instructions for the 0 mark colum. (Cam lever is set at KNIT–IN 2.)

(4) Now you are ready to knit Fair Isle patterns.
Before you knit the second row, first stop the carriage at 1 or 2 inches from the edge of the garment. Remove the contrasting yarn from the yarn hook at one end of the needle bed, and hook it to the yarn holder at the proceeding side of the carriage.



(5) Knit one row, which is the first row of your Fair Isle pattern in two colors. The latch needles will line up in C position after knitting.

(6) While you are moving the carriage toward the end of needle bed (Do not go too far away.) remove the yarn from the yarn holder by pulling it toward you in the motion as if you drew a circle.
Now bring back the carriage toward the garment, hook the yarn to the yarn holder same as explained in 4, to knit the second row.

(7) Continue knitting, changing the hooking of contrasting color each time, until STOP sign appears in the pattern panel window and you hear the Buzzer.

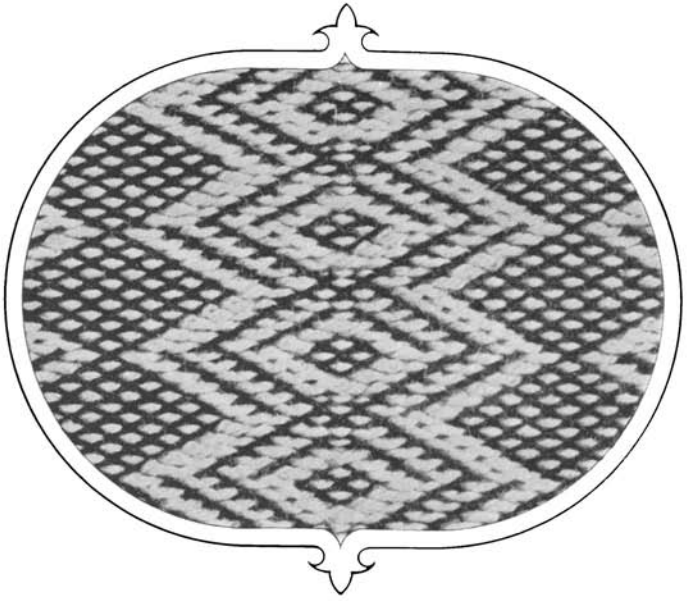
(8) Return the card from STOP to the ▬ mark by turning the feed dial backward.

(9) Knit one row, following instructions for the ▬ mark indicated by a red arrow.

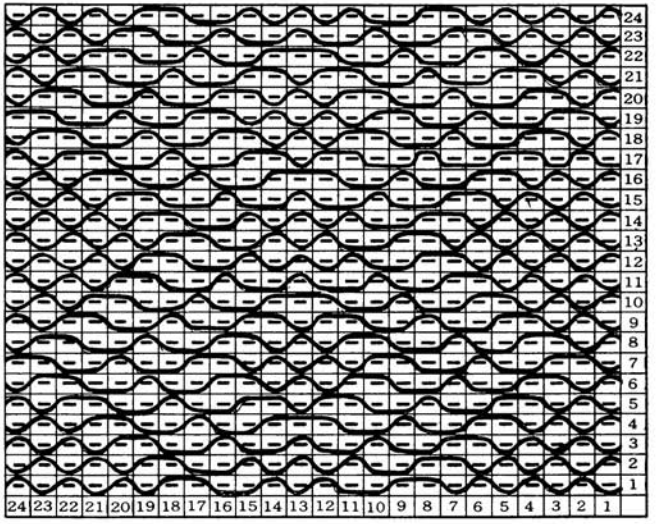
(10) Repeat the instructions from 0 to STOP and back to the ▬ mark pointed by a red arrow.

* The weights holding the knitted piece downward must be moved upward as the knitting operation progresses.

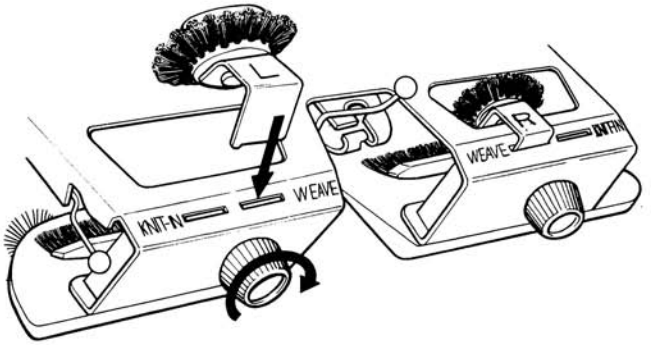
WEAVING



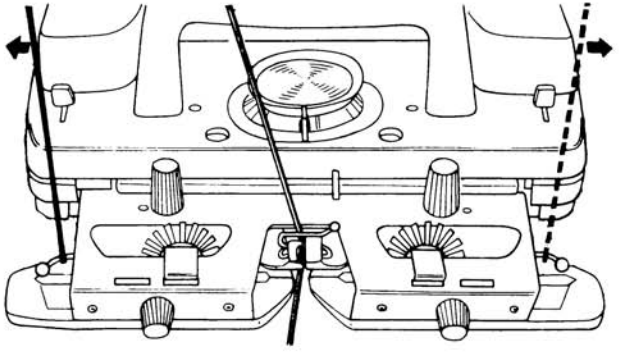
* This is a method in which a different colored yarn or a thicker yarn is knitted into the fabric, bringing the pattern to the wrong side of the garment to give it a woven effect. In this case, a medium yarn is used for the base knitting and a thick yarn for threading.



Weaving stitch
Stitches knitted by threading another yarn through the fabric.



* Install the right auxiliary arm into the right-side auxiliary arm slot (WEAVE) and the left auxiliary arm into the left-side slot and tighten the auxiliary arm nuts.

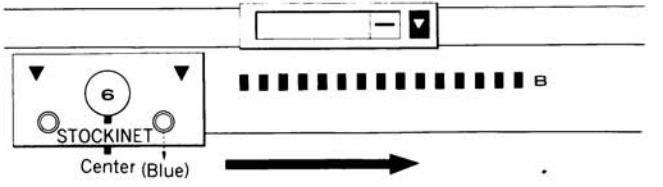


* Thread the base knitting yarn through the yarn feeder and change the threading yarn to the yarn holder on the arm in the direction in which the carriage is to be moved in the same way with Fair Isle knitting.

CARD No. 14-A				WEAVING 〈I〉	
PAT. RS.	YARN 2nd MAIN	CAM LEV.	RUSSEL LEV.	SIDE LEV. (BOTH)	D. (RS.)
—	■	STOCKINET	(Blue)	▼	→
—	■ ■	STOCKINET	(Red)	▼	→
0	■ ■	STOCKINET	(Red)	▼	←
≀	■ ■	〃	〃	〃	≀ (59)
58	■ ■	〃	〃	〃	←
STOP					
SET STOP KNOB TO ▼ MARK.					

ONE PATTERN-24 STITCHES AND 12 ROWS

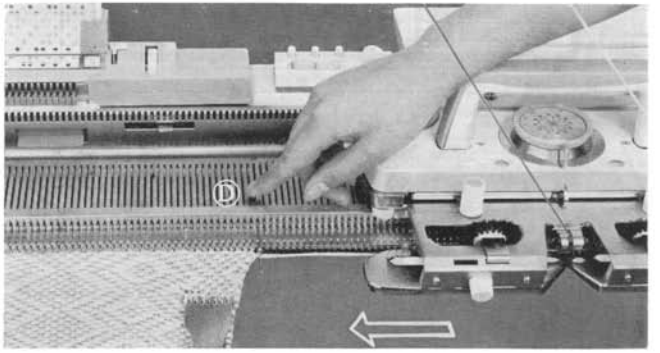
Page 43 in the pattern book



(1) Insert the punched card No. 14-A in the pattern panel and set the carriage, following instructions in the upper ▬ mark line. Knit one row with the main yarn coming from the yarn feeder. (This is a row of stockinet before starting pattern knitting.)

(2) Attach the accessory weights to both ends of the knitted piece.

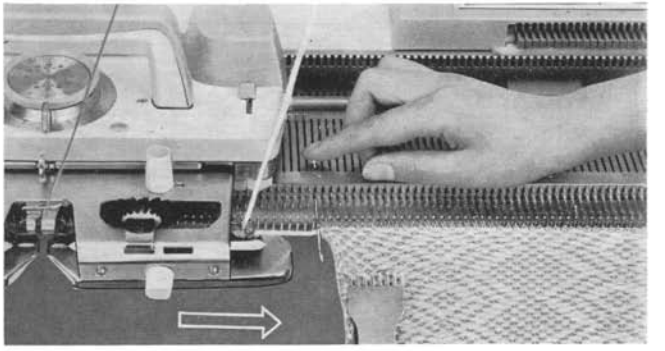
(3) Set the carriage, following the instructions in the operation table.



(4) To prevent the knitted pattern from being shaped wrong, bring one end needle to the D position on the carriage side and hook the threading yarn onto the yarn holder on the arm in the direction in which the carriage is to be moved.

(5) Knit one row, moving the carriage in the direction indicated by an arrow.

(6) Bring a needle on the side with the carriage on to D position and change the threading yarn to the yarn holder on the arm in the direction in which the carriage is to be moved and continue knitting.



(7) Move the carriage from left to right.

(8) Continue knitting, changing threading of yarn each time until STOP sign appears in the pattern panel window and you hear the Buzzer. (The needle nearest to the carriage is to be brought out to D position before you knit each row.)

(9) Return the card from STOP back to the ▬ mark.

(10) Knit one row, following the instructions in the ▬ mark line indicated by a red arrow.

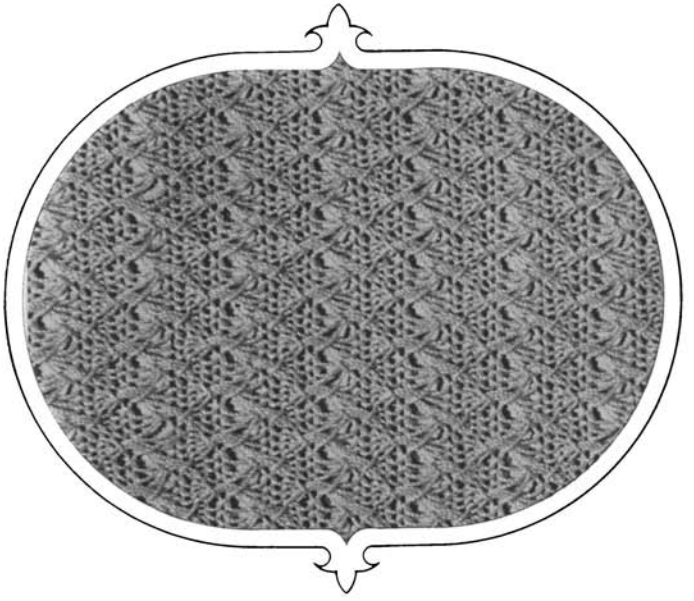
(11) Continue knitting, repeating the process of proceeding from 0 to STOP and back to the ▬ mark indicated by a red arrow.

Note: * Set the Russel lever to the right (red) for operating the needles pulled to the D position at the end of the knitted fabric.

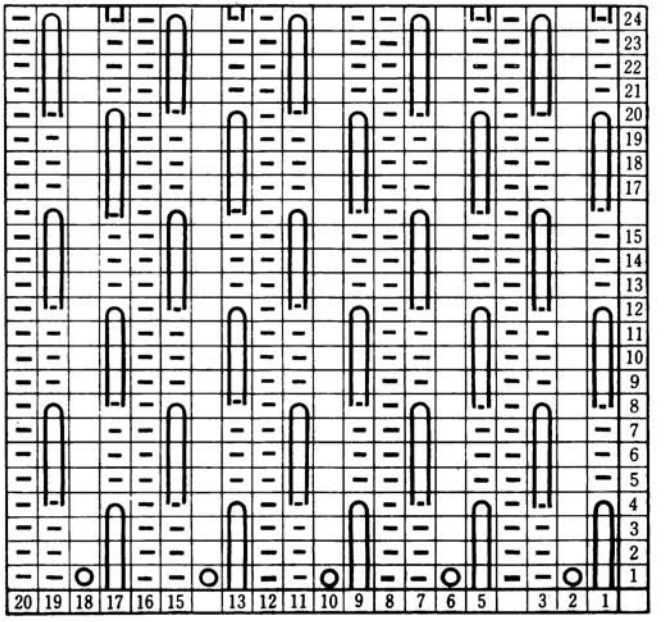
* The tension dial must be adjusted as follows for the threading yarn.

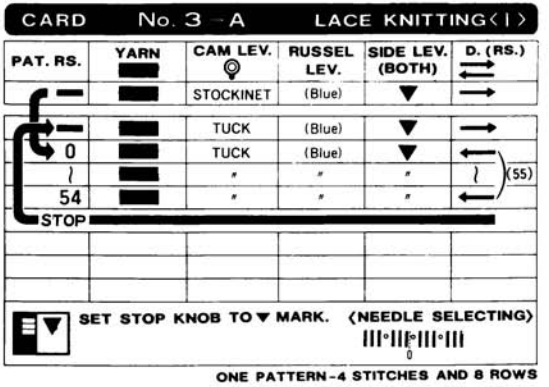
Medium yarn
Thick yarn
} 4~5

LACE KNITTING

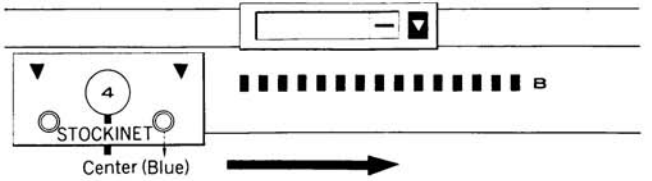


* Lacy patterns are openwork, the designs knitted with thin cotton thread, summer yarns or very thin woolen yarn and the like. By using the techniques of resting needles and tucking stitch, delicate, ornamental fabric can be knitted very easily.

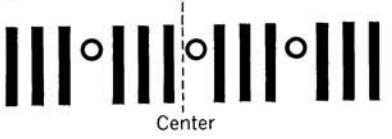




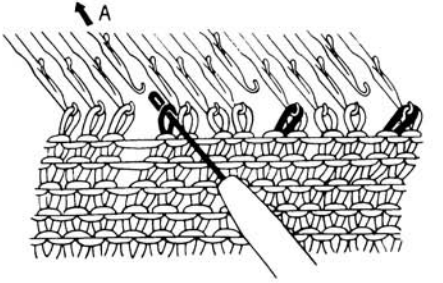
Page 55 in the pattern book.



(1) Insert the punched card No.3-A in the pattern panel and knit one row of stockinet, moving the carriage in the direction indicated by an arrow, following the instructions in the ▬ mark line in the operation table.

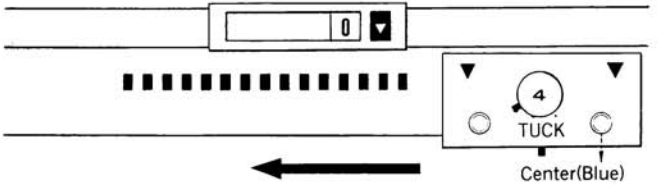


(2) Beginning at the center of the needle bed, transfer the stitches corresponding to (0) marks on the needle selecting diagram in Operation Table onto the adjacent needles. Then, push back the needles now remained empty to A position.



Note : If design is knitted for bonding yardage, select the needles according to the operation table before casting on and ▬ mark is knit. This eliminates the need for the decreasing procedure.

(3) After completion of the above (2) procedure, set the carriage, following the instructions in the operation table.

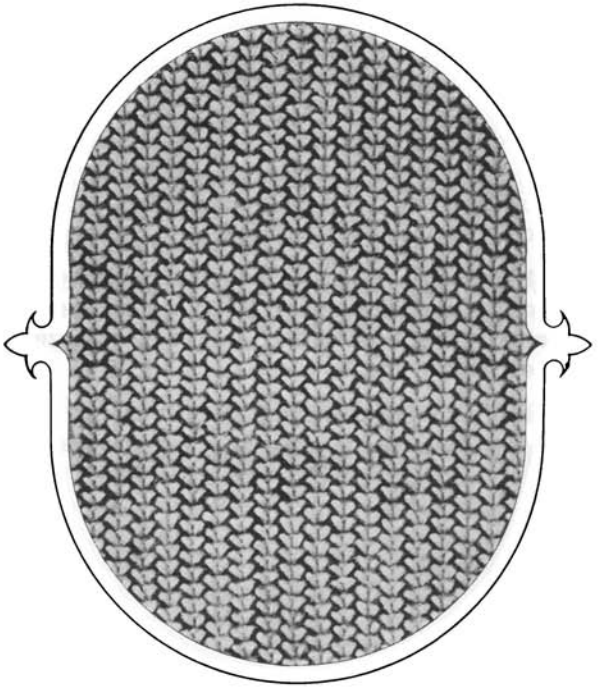


(4) Continue knitting from 0 to STOP and you will hear the Buzzer. Then, rewind the Punched Card back to ▬ mark.

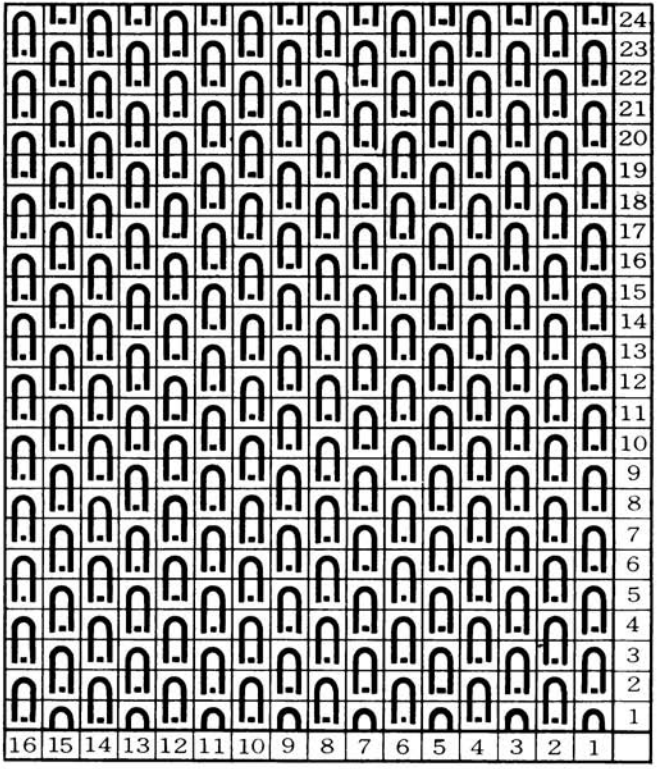
(5) Knit one row, following the instructions in the line of the ▬ mark indicated by the red arrow.

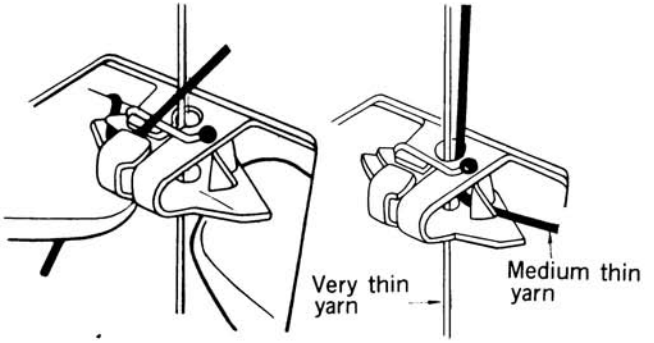
(6) Continue knitting, repeating the process from 0 to STOP and back to the ▬ mark indicated by the red arrow.

TWO THREAD KNITTING



* The added yarn forms lined look on the wrong side of fabric, and shows through just enough to produce a tweed effect.





(1) Thread the main yarn through the yarn feeder and the stranding yarn (lining) through the adding yarn feeder.

The stranding yarn must be passed through the adding yarn feeder from its left side.

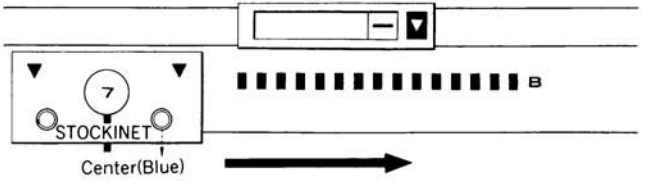
CARD No. 1 — A TWO THREAD KNITTING <1>

PAT. RS.	YARN 2nd MAIN	CAM LEV.	RUSSEL LEV.	SIDE LEV. (BOTH)	D. (RS.)
—		STOCKINET	(Blue)	▼	→
—		TUCK	(Blue)	▼	→
0		TUCK	(Blue)	▼	←
≀		〃	〃	〃	≀ (59)
58		〃	〃	〃	←
STOP					

SET STOP KNOB TO ▼ MARK.

ONE PATTERN-2 STITCHES AND 2 ROWS

Page 62 in the pattern book.



(2) Insert the punched card No.1-A in the pattern panel and knit one row following the instructions in the upper ▬ mark line in the operation table. The adding yarn will knit stockinet with the main yarn.

(3) Set the carriage for the line 0 of operation table and continue knitting until STOP sign appears in the pattern panel window and you hear the Buzzer. Then, rewind the Punched Card back to ▬ mark.

(4) Knit one row following the instructions in the line of the ▬ mark indicated by a red arrow and continue knitting, repeating the process from 0 to STOP and back to the ▬ mark indicated by a red arrow.

Note: Thin woolen yarn is recommendable for the adding yarn, since two yarns are knitted at one time.

For example: Ordinary 4 ply wool and 2 ply wool
3 ply wool and 2 ply wool

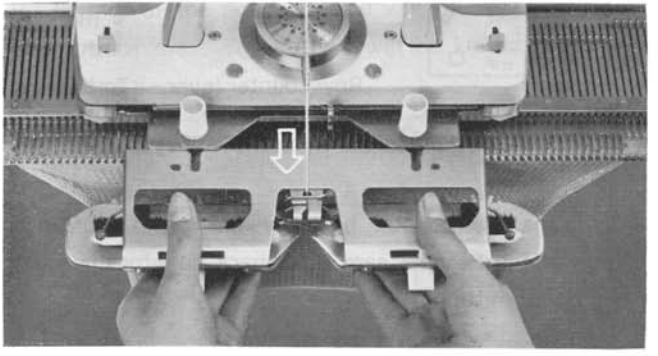
* Fabric with an interesting look can be knitted by using two different colored thin yarns or fancy yarn.

5. IF WRONG STITCHES ARE KNITTED

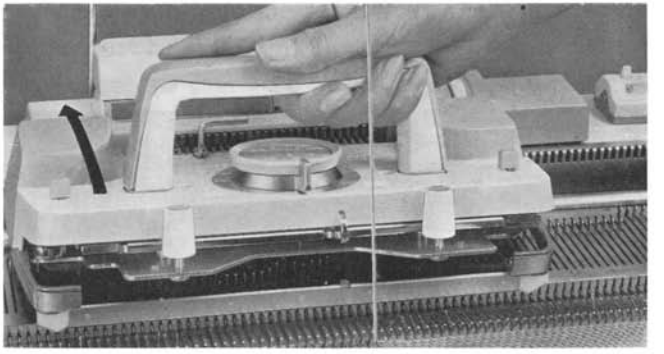
This knitting machine is so designed that the "artificial brain" reads the intended pattern from a punched card and memorizes it. When the carriage is moved, the machine will knit the pattern that has been memorized by the "brain" in the direction in which the carriage moves and at the same time the other "brain" at the rear memorizes the pattern to be knitted next. Even a person who uses this machine for the first time will be able to knit an elaborate patterns very easily.

* If something wrong took place during the knitting operation, correct it by following the procedures recommended below.

(A) If the Carriage Jammed While Knitting



(a) Loosen the arm nuts and remove the arm from the carriage.

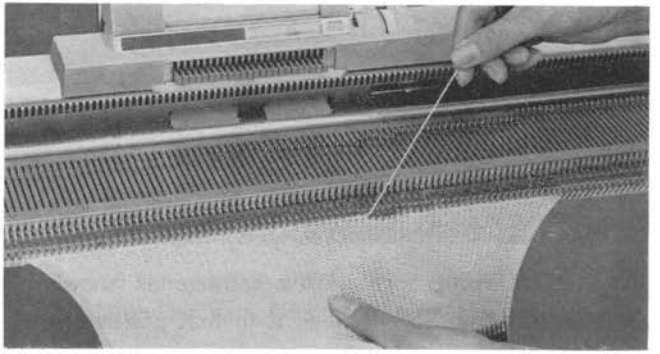


(b) Lift the front edge of the carriage as shown by the photo above. Holding it in that position, bring back the carriage. Replace the arm and continue knitting.

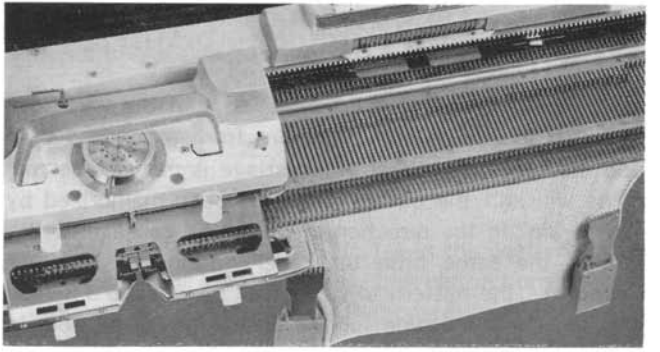
* The needles with the loops which have been pushed behind the latches must be pushed back to the B position, using the accessory transfer tool.

(B) How to Correct Incorrect Knitting

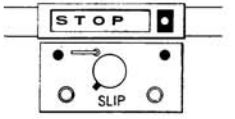
(a) In Stockinet



* Attach the weights to the knitted fabric so that it may be pressed tightly onto the needles. With the left hand pull the fabric downward, and undo all the stitches to be repaired.



* If the carriage is on the opposite side of the yarn after ripping rows, set the following controls as instructed.

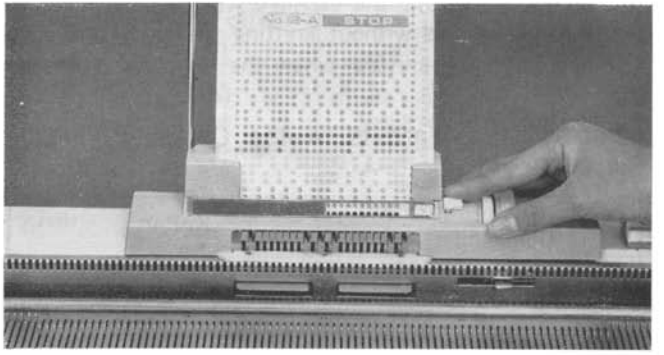


Cam lever..... Slip
Side lever..... ● mark on both sides
Row counter lever... To the side

Move the carriage to the side with the yarn

* Turn the row counter back by the number of rows unravelled. Set the cam lever back to stockinet and continue knitting.

(b) In Pattern Knitting

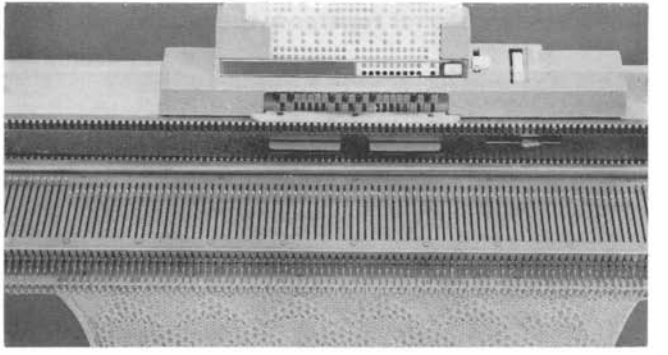


1 First, the relationship between the punched card and the touch lever must be understood.

* Set the stop knob to the solid circle ● mark and the pattern of the punched card will be indicated by the touch levers. The pattern will be knitted by moving the carriage.

Perforated area of card	Touch lever rises
Unperforated area of card	Touch lever lowers

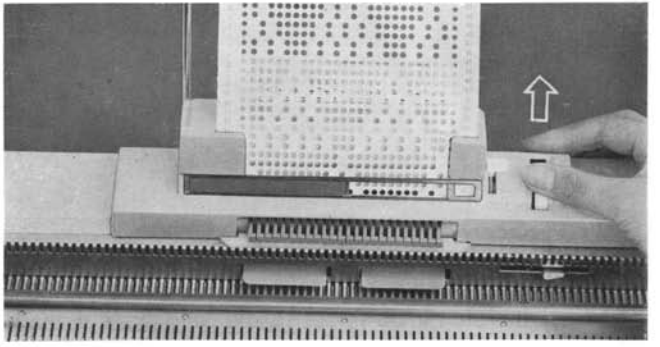
* If you want to check the pattern in the last row that has just been knitted, turn the card back by one row and set the stop knob to the solid circle ● mark and the pattern you want to check will be indicated by the touch levers.



Note : If the stop knob is set to the solid circle ● mark, the feed dial will not move.

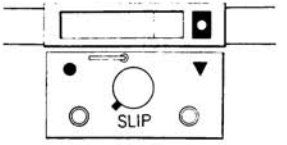
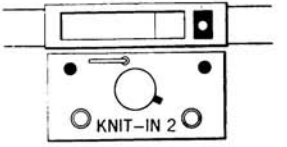
2. Correcting Pattern Stitches

* Rip out as many rows as needed to repair knitted piece. (In the case of Fair Isle undo the fabric after the needles have been lined up in the B position.)
* Turn the punched card and the row counter back by the number of rows unravelled.

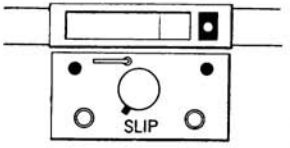
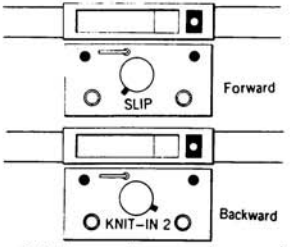


* If the stop konb and the carriage are set as instructed below, the carriage will be moved across the needle bed without knitting and memorize the pattern to be knitted when the carriage is moved next.

When Knitting Yarn Is in the Opposite Side of Carriage

Pattern knitting other than knit-in	Knit-in
(1) Stop knob.....(●) Cam lever.....Slip Side lever.....(●) in the direction of carriage movement Row counter lever.....Turned aside	(1) Stop knob.....(●) Cam lever.....Knit-in 2 Side lever.....(●) on both sides Row counter lever.....Turned aside
	
Set the cam lever as shown above and return carriage to the side of yarn.	Set cam lever as above and return carriage to the side of yarn (needles will be back in C position).
(2) Reset stop knob to ▼ and carriage controls to their former positions and knit on.	(2) Set stop knob to ▼, turn row counter lever crosswise and knit on.

When Knitting Yarn Is on the Same Side of Carriage

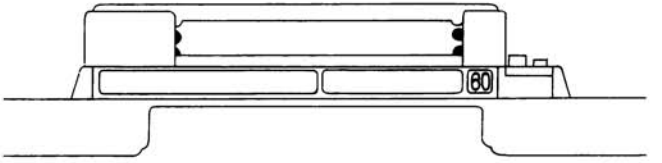
Pattern knitting other than knit-in	Knit-in
(1) Stop knob.....(●) Cam lever.....Slip Side lever.....(●) on both sides Row counter lever.....Turned aside  Set the cam lever as above and move the carriage back and forth. (2) Set stop knob to ▼ and reset carriage controls to their former positions and knit on.	(1) Stop knob.....(●) Cam lever.....Forward (Slip) Backward (Knit-in 2) Side lever.....(●) on both sides Row counter lever.....Turned aside  Set the cam lever as above and move the carriage back and forth. Forward { Carriage moves without knitting. Backward { Carriage moves without knitting and needles come out in C position. (2) Set stop knob to ▼ and turn side lever crosswise and knit on.

Note: * Be sure that the stop knob is reset to ▼ mark before you resume knitting.

* If you operate the machine to knit a pattern with the stop knob remaining at ● mark, the punched card will not be advanced. In this case, follow the same procedure instructed on page 35 (b).

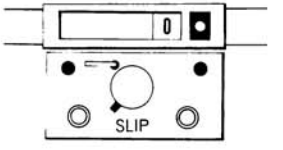
(C) Knitting Beyond "STOP" Sign on Punched Card

1. Undo the over knitted rows one by one while turning back the row counter each time a row is undone. Continue this procedure until the final number mark of the punched card appears in the pattern panel window.



Note: In case only one row is over knitted, return the Punched Card to 0 mark instead of ▬ mark and continue knitting.

2. Number mark on card..... 0
   Stop knob ..... ● mark
   Cam lever ..... Slip
   Side lever ..... ● mark on both sides
   Row counter lever..... Disengaged

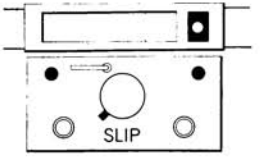


After following the above instructions to have the machine memorize the desired pattern correctly, set the side lever to ▼ mark, reset carriage controls to their former positions and start knitting again.
(Refer to "Correcting Pattern Stitches" on page 38.)

(D) When Carriage Is Accidentally Pulled off The Rail in the Middle of Pattern Knitting

If the carriage is pulled off the rail in the middle of pattern knitting, the pattern will be dislocated. To make correction, follow the instructions given below.

Stop knob ..... ● mark
Cam lever ..... Slip
Side lever ..... ● mark on both sides
Row counter lever ..... Turned inside



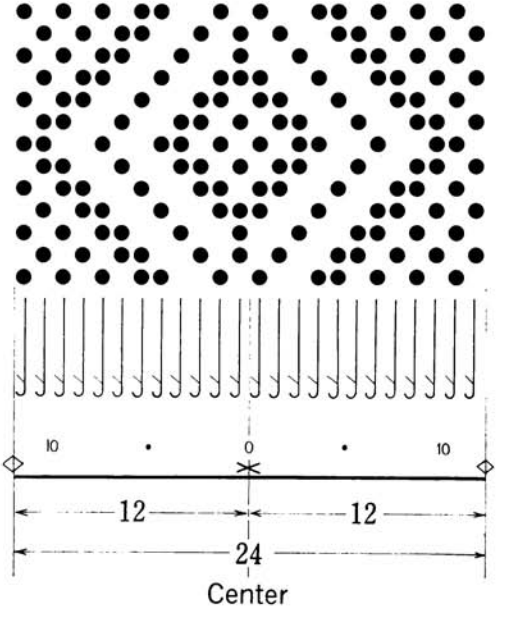
1. After making the above adjustments, move the carriage back and forth.
2. Reset the carriage controls to their former positions and knit.

(E) The Needle Selection Marks on the Needle Bed

The needle bed has the × marks and ◇ marks in addition to the numbers that indicate the number of needles.

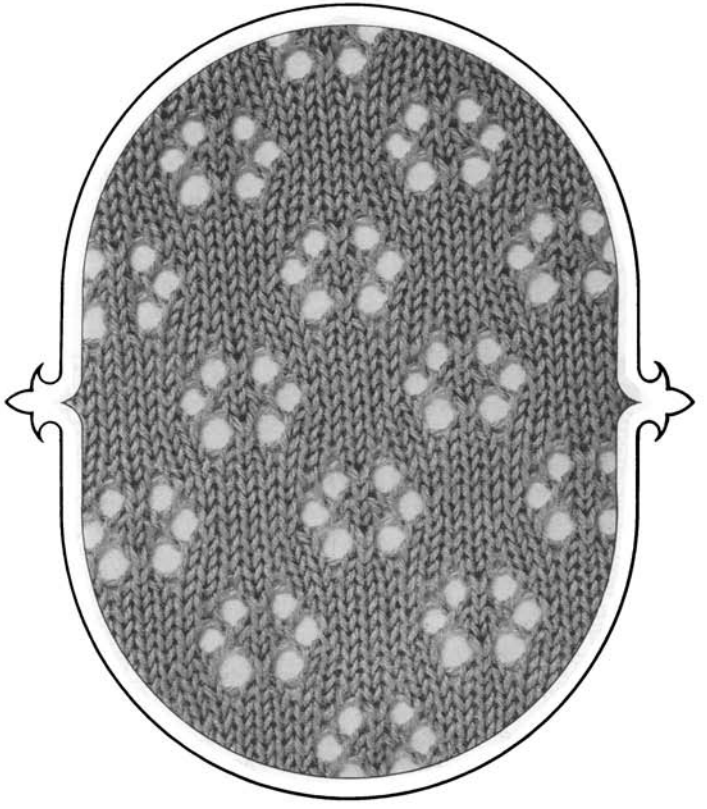
× mark... Indicates the center position of the punched card.

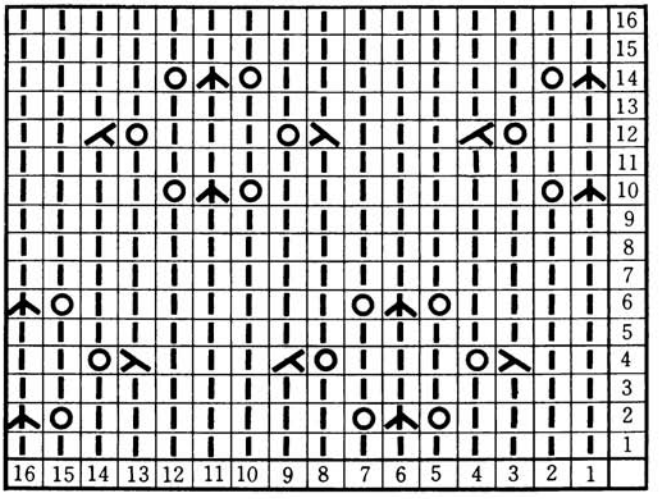
◇ mark... Indicates the breadth of the pattern on the punched card (24 stitches), 12 stitches on either side of the × mark.



PATTERN KNITTING WITHOUT USING A PUNCHED CARD

LACE KNITTING





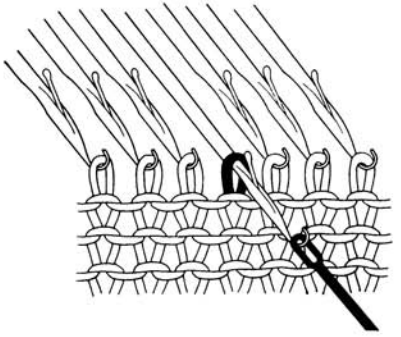
Knit Stitch
Face loop of stockinet

Empty stitch
Hole made by transferring the stitch to the next needle

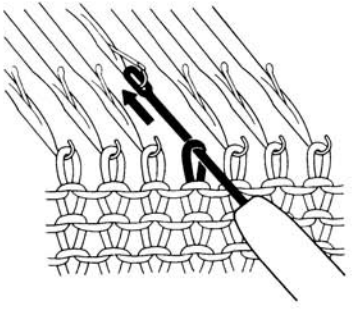
Two stitches knitted together
Left stitch transferred to right needle

Two stitches knitted together
Right stitch transferred to left needle

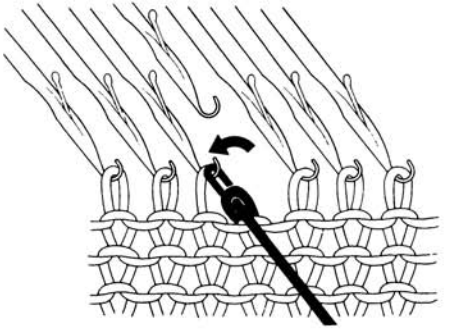
Three stitches knitted together
Center stitch on top of left and right stitches



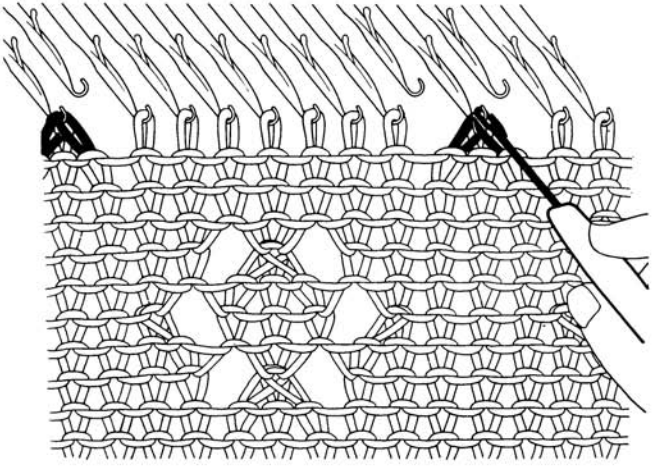
(1) Knit two rows of stockinet stitches. Use the transfer tool to pull the needle in the position marked with o in the pattern chart out to the D position.



(2) Push the needle back to its former position and the stitch will slide over the latch onto the transfer tool.



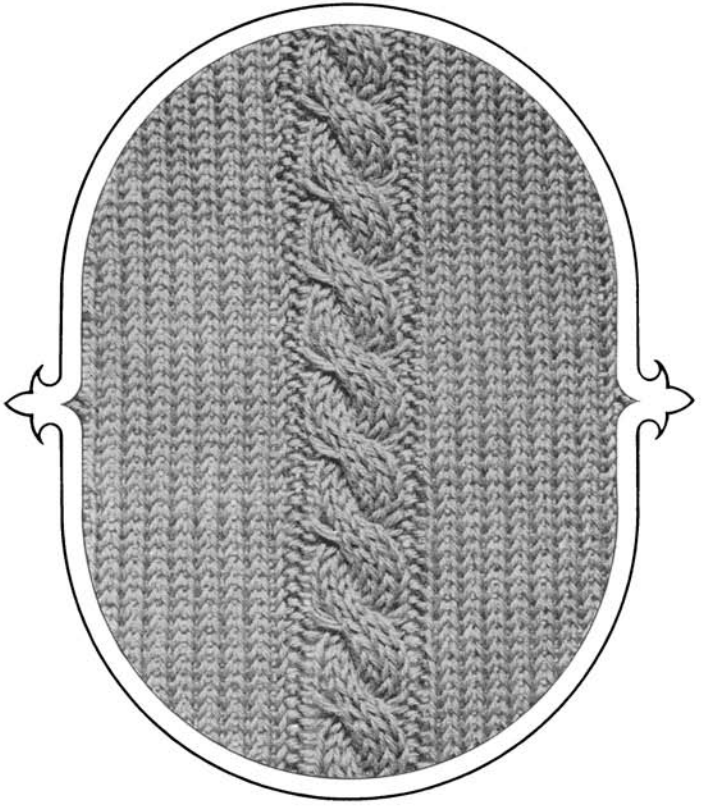
(3) Transfer the stitch on the tool onto the adjacent needle, following the instructions on the chart.

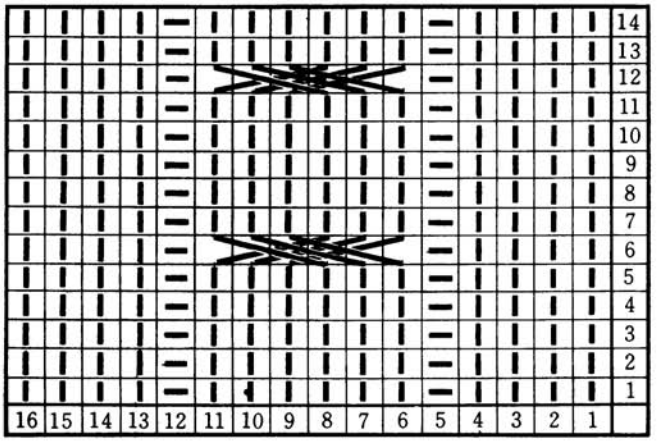


(4) Repeat the procedures 1 through 3, knitting two rows between each decrease and pulling empty needles back to the B position to knit again.

PATTERN KNITTING WITHOUT USING A PUNCHED CARD

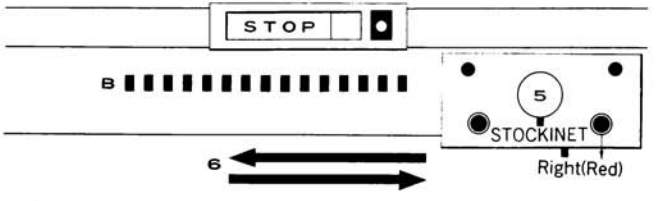
CABLE PATTERN



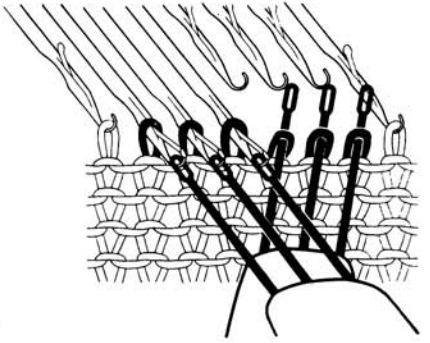


Purl stitch
Back loop of stockinet.

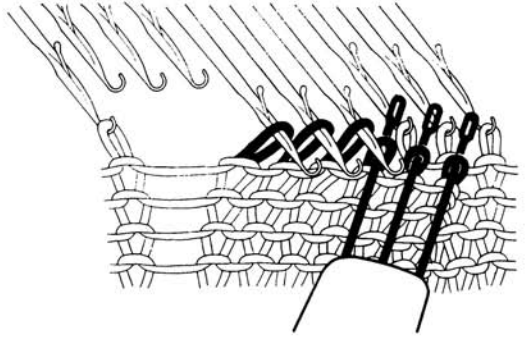
Crossing Right Over Left
Loops crossed with the right stitch over the left.



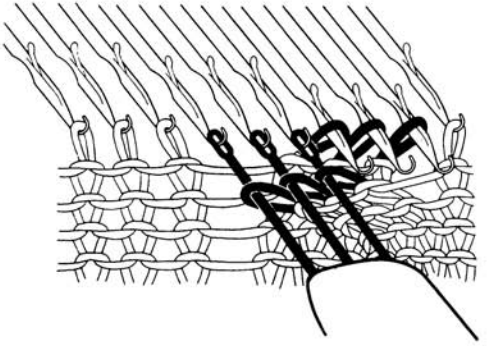
(1) Set the carriage to stockinet and knit 6 rows. (More rows can be knitted according to the size of the yarn used.)



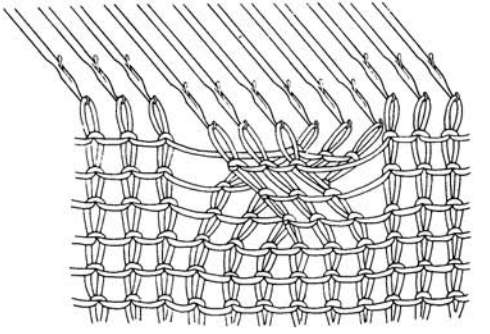
(2) Useing two three-eye transfer tools, take three stitches off the needles on one transfer tool and the adjacent three stitches onto the other in the same manner.



(3) Move the left hand group of three stitches to right and the right hand group to left so that they will cross each other.



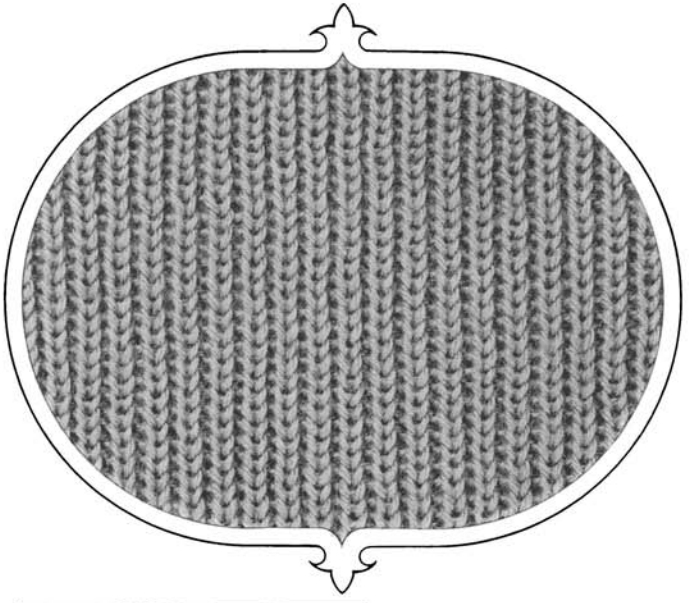
(4) Hook the stitches onto the empty needles.

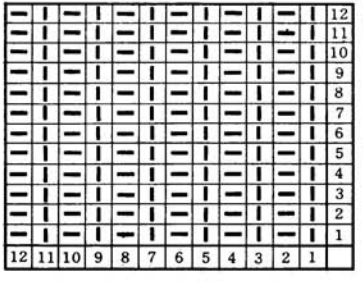


(5) Pull the six needles to the D position with Russel lever to red, and knit six rows.

(6) Repeat the above procedure crossing the stitches in the same direction each time. After knitting about 15 rows, work a purl stitch on each side of cable patterns, and repeat.

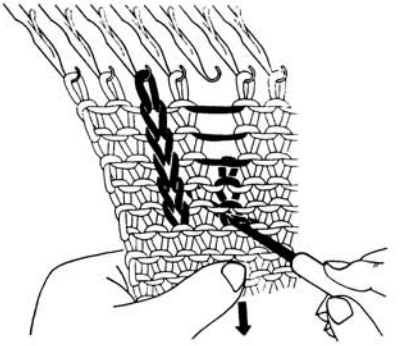
RIBBING



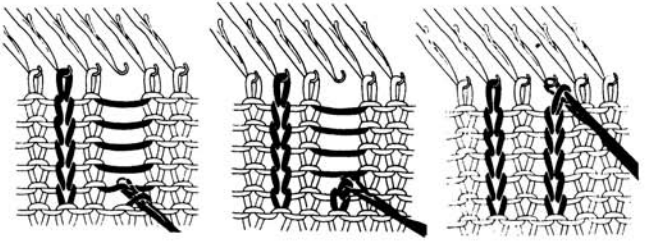


(1) Set the stitch dial one number lower than for stockinet.

Note: If the yarn used is very thin, set the dial two numbers lower.

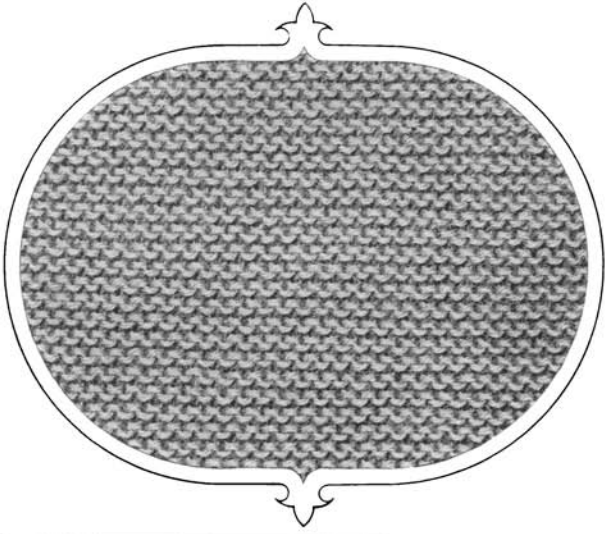


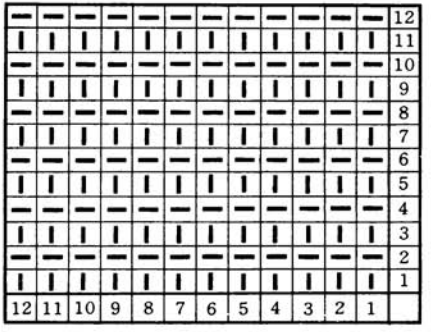
(2) Knit stockinet for the desired amount of ribbing. Insert the hook of a tappet through the loop that begins the ribbing and drop the stitch from the third latch needle by pulling to the D position and then pushing back to the B position.
Use tool or finger to undo the dropped stitches.



(3) Repeat the operations shown in the above figures and transfer the last stitch onto the latch needle.

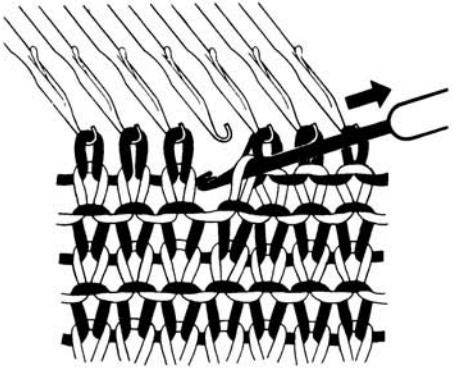
GARTER STITCHES





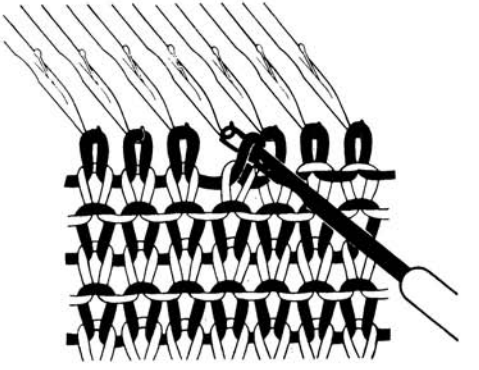
(1) Set the stitch dial one number lower than for stockinet knitting.

(2) Knit two rows.



(3) Open the latches of all needles and purl (rib) all the stitches of the second row with the tappet.

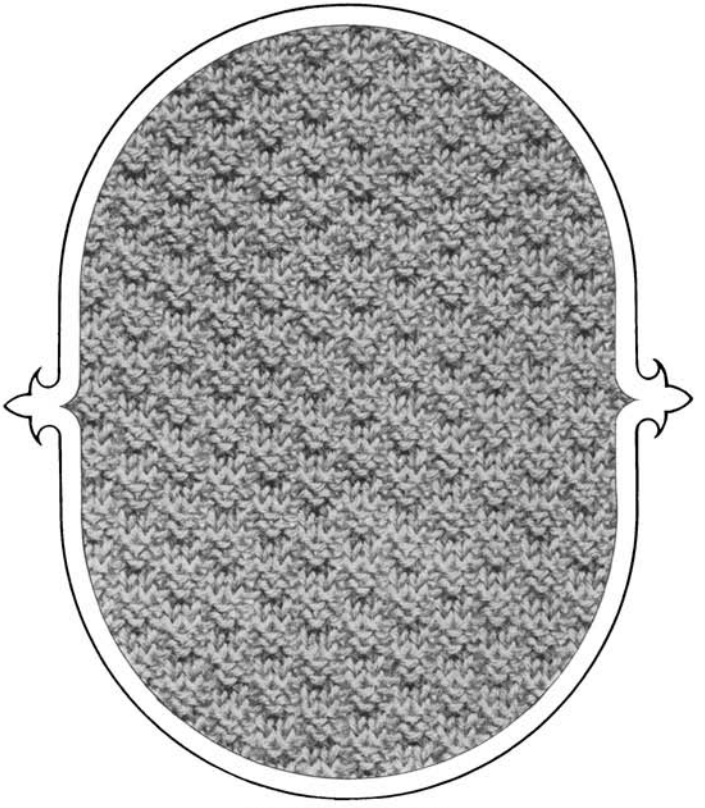
Note: The garter bar is a handy tool to turn over all stitches at once without the use of the tappet. The use of this tool makes the operation much easier and quicker.



(4) Repeat the procedures (2) and (3).

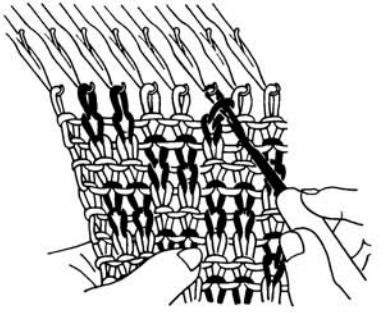
PATTERN KNITTING WITHOUT USING A PUNCHED CARD

SOLID PATTERN OF KNIT AND PURL STITCHES



(Basket Stitches)

▮	▮	—	—	▮	▮	—	—	▮	▮	—	—	12
▮	▮	—	—	▮	▮	—	—	▮	▮	—	—	11
—	—	▮	▮	—	—	▮	▮	—	—	▮	▮	10
—	—	▮	▮	—	—	▮	▮	—	—	▮	▮	9
▮	▮	—	—	▮	▮	—	—	▮	▮	—	—	8
▮	▮	—	—	▮	▮	—	—	▮	▮	—	—	7
—	—	▮	▮	—	—	▮	▮	—	—	▮	▮	6
—	—	▮	▮	—	—	▮	▮	—	—	▮	▮	5
▮	▮	—	—	▮	▮	—	—	▮	▮	—	—	4
▮	▮	—	—	▮	▮	—	—	▮	▮	—	—	3
—	—	▮	▮	—	—	▮	▮	—	—	▮	▮	2
—	—	▮	▮	—	—	▮	▮	—	—	▮	▮	1
12	11	10	9	8	7	6	5	4	3	2	1	



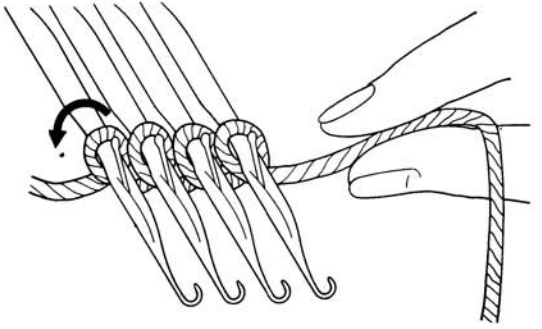
(1) Knit two rows.

(2) Refer to the pattern chart, drop the stitches marked (▮), and purl them with the tappet.

(3) Repeat the procedures (1) and (2).

CORDING

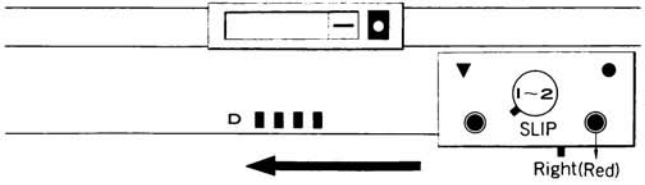
* This method is used for knitting the cords for a cape, a hood or belt.



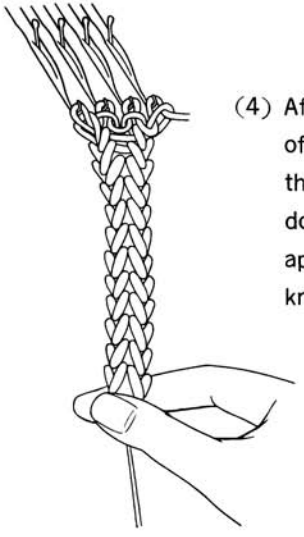
(1) Pull to D position 3 to 5 needles depending on thickness of the cord to be made. Form stitches by making loops around the needles as shown in the above figure.

(2) Set the stop knob and the carriage controls as instructed below.

Stop knob ..... ● mark (stockinet card should not be used)
Cam lever ..... Slip
stitch dial ..... 1 ~ 2 (medium yarn)
Side lever..... Forward =▼ mark
Backward= ● mark
Russel lever ..... Red (Right)



(3) Knit a row, moving the carriage back and forth. Next, bring the needles out to D position, holding the knitted cord in fingers.



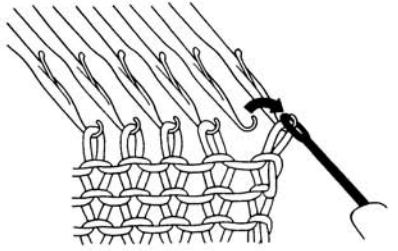
(4) After repeating the procedure of (3) about five times, move the carriage while a gentle downward pressure is being applied on the tail of the knitted cord.

6. FOR KNITTING GARMENTS

* Knitted garments are not shaped by cutting like the woven fabrics. It must be shaped while it is being knitted by increases, decreases and partial knitting. Besides, as there are many ways of increasing, decreasing and partial knitting, choose any of these methods considering the effect on your garments.

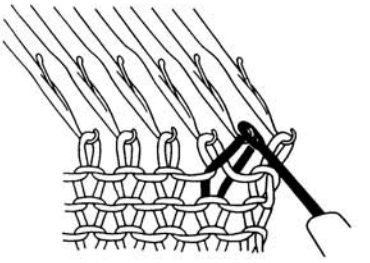
(A) Increasing stitches

* Increasing one edge stitch:

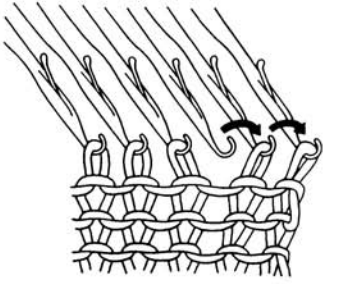


(a) The first way

1. With the one eye transfer tool, transter an edge stitch onto the hook of the next vacant latch needle leaving the second needle empty.

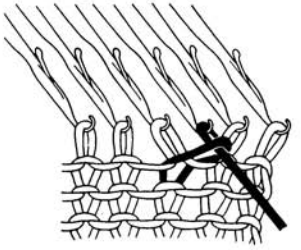


2. Take the heel of the second stitch and place it on the empty needle to increase one stitch.

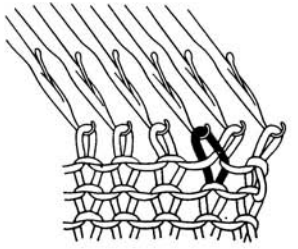


(b) The second way

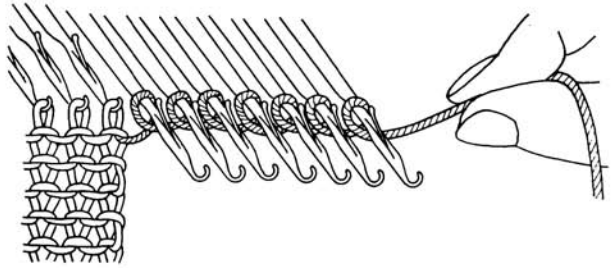
1. With a two eye transfer tool, transfer the last two sritches over one space so that the third needle will be vacant.



2. Take the heel of the third stitch and place it on the empty needle to increase one stitch.



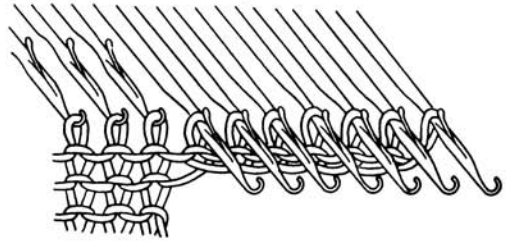
Note: The illustration shows another way of forming a new stitch.



* Increasing two or more edge stitches

(1) Bring out the empty needles required to be increased to D position on the side with the carriage on.

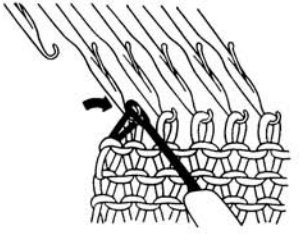
(2) Wind the knitting yarn loosely around each of the needles behind the open latch. (Wind in counter-clockwise direction for increasing on right edge, and in clockwise direction for increasing on left edge.)



(3) Set the Russel lever to RIGHT position and knit across.

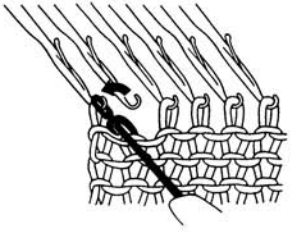
(B) Decreasing stitches

* Decreasing one edge stitch:



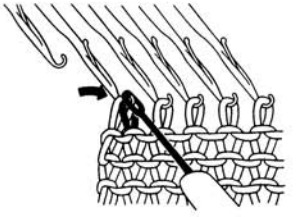
(a) The first way

With a one-eye transfer tool, transfer the first stitch onto the second stitch .



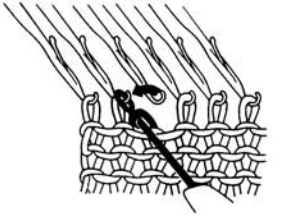
(b) The second way

With a one eye transfer tool, transfer the second sitch from the edge onto the edge stitch.



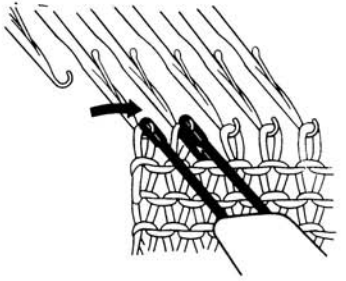
Place both stitches onto the empty second needle.

Be sure to push the empty needle back into A position.



(c) The third way

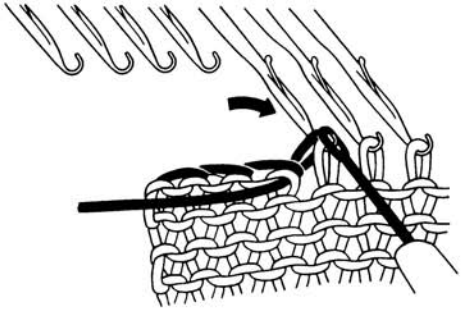
With a one-eye transfer tool, transfer the third stitch from the edge onto the second stitch.



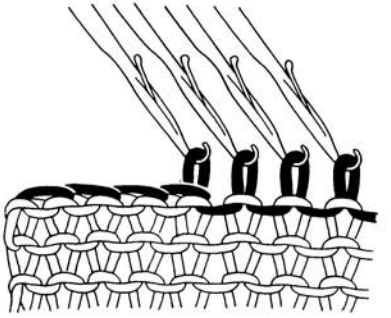
With a two-eye transfer tool take the two stitches on the second needle and the stitch on the first needle to the empty needles.

Be sure to push the empty edge needle back to A position.

NOTE: The inner the decreases are made the wider your fashion line will be on your garment.



(d) Decreasing two or more edge stitches on the side where the carriage is on:

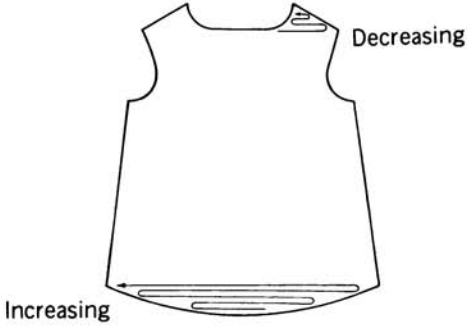


Referring to the second way of decreasing, bind off all the stitches except the last one to be decreased.

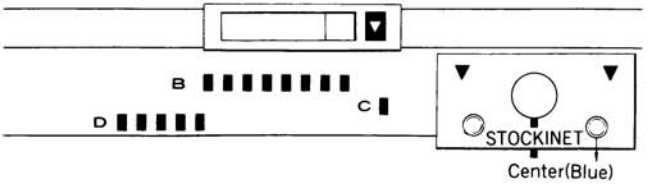
Transfer the last decrease stitch onto the next needle, then, knit the next row using the carriage.

(C) Partial knitting

As illustrated below, partial knitting is widely employed to shape shoulders, lower edge of garments, side darts, etc.



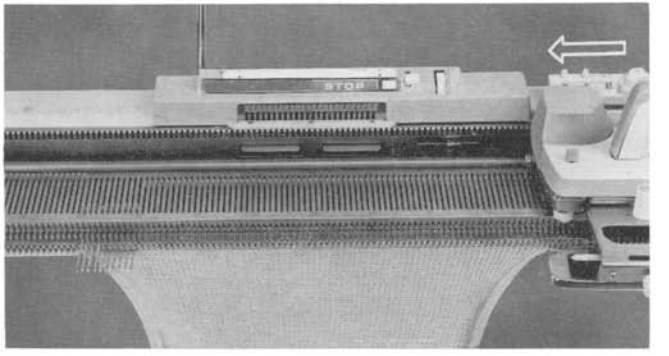
Note : * For partial knitting, the Russel lever must be set to CENTER (Blue). Be sure that the lever is set correctly, because if you knit with the lever remaining at RIGHT (Red) the needles rested in the D position will be knitted in.



* With weaving, the end needle is brought out to the D position. For partial knitting, however, it must be placed in the C position.
* Cam lever and side levers must be set correctly in the positions specified for the types of pattern to be knitted.

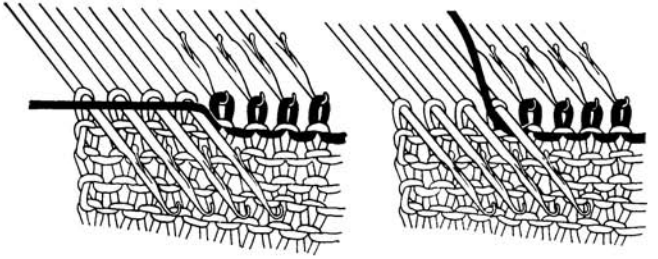
* Decreasing Stitches

In both stockinet and pattern knitting, set the cam lever and side levers as required by the type of knitting and the needles that are to be rested must be placed to the D position. Continue knitting, following the instructions given below.

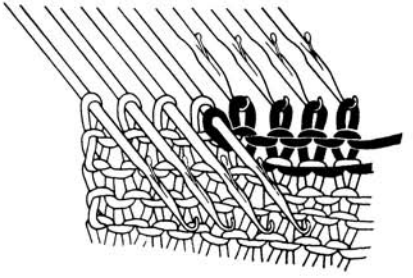


(1) Bring the needles on the opposite side of the carriage, which are not used, to the D position and operate the carriage to knit one row.

(The needles in the B position knit the yarn. The needles in the D position remain idle and the yarn passes over them.)

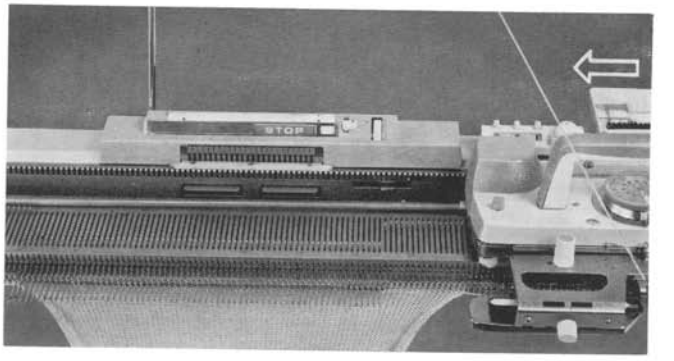


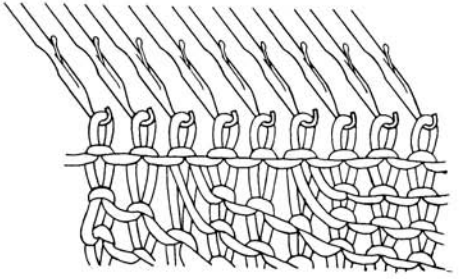
(2) To prevent a hole from being formed in the fabric, pass the yarn under the first resting needle and then over the other needles.



(3) Knit one row by moving the carriage back.

This completes the first operation for partial knitting.

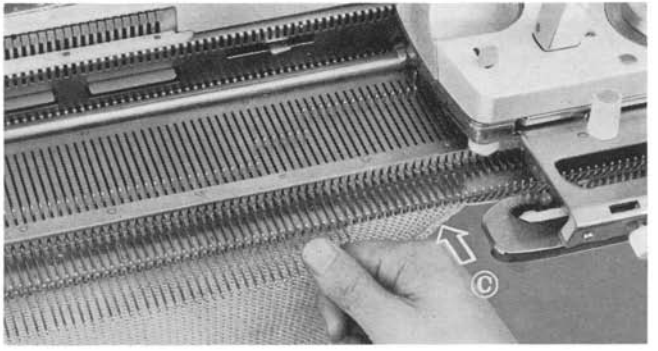




(4) Repeat the procedures (2) and (3), bringing an increasing number of needles to the D position.

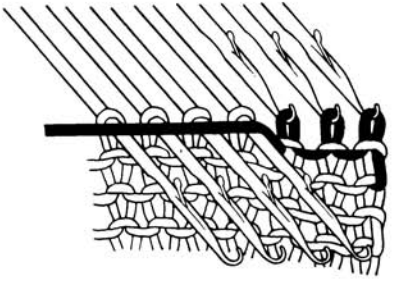
After completion of partial knitting, set the Russel lever to right (red) and knit one row. All the needles in both B and D positions are worked and they are all lined up in the B position.

* Increasing Stitches



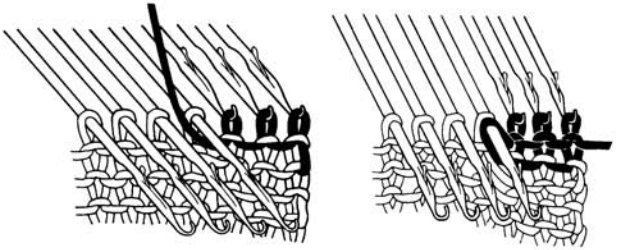
Knit returning a desired number of needles, which have been rested in the D position, to the position where they can be operated.

There are two methods, as explained below, for bringing the needles back to operation.

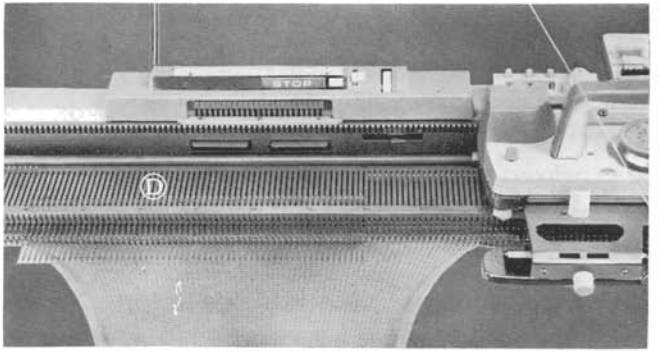


(a) In Stockinet and Knit-in

1. Bring the first latch needle on the side of the carriage to the B position and other needles to the D position. Knit one row.

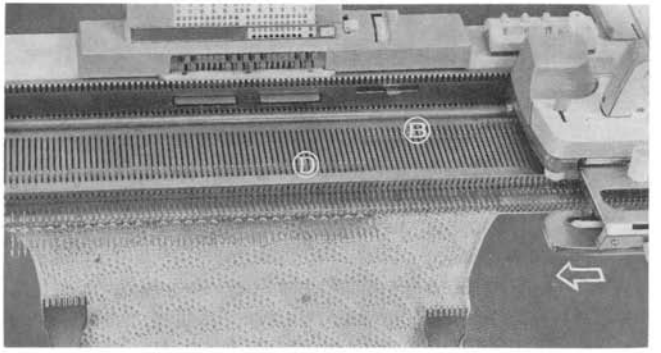


2. To prevent a hole from being formed in the fabric, pass the yarn under the first resting needle and then over other needles.
3. Knit one row.
   This completes the first operation for partial knitting.
4. Push a desired number of the needles, which have been rested in the D position, back to the C position and knit the third row.
   (When the needles are pushed back to the C position, be sure that they are correctly positioned within the range marked by the sign].)



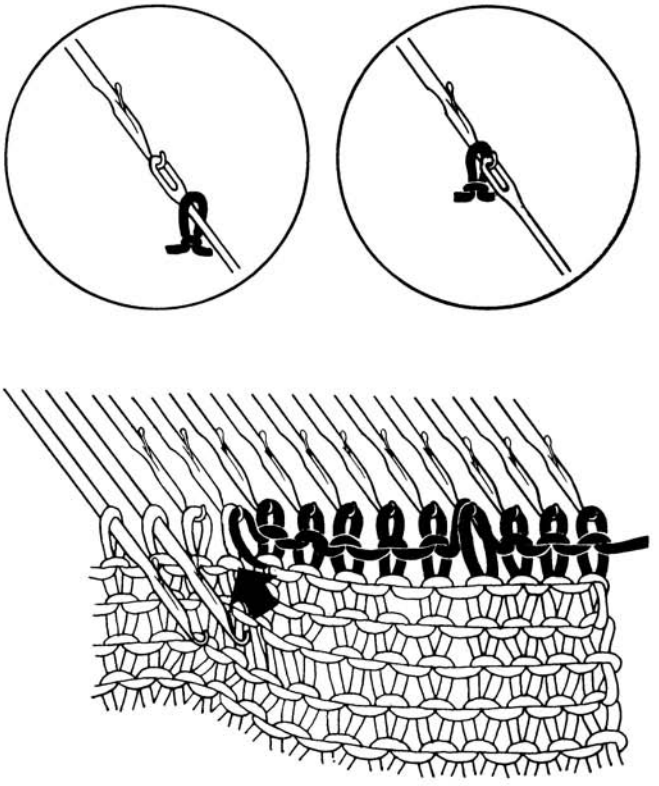
5. Repeat the procedures (2) through (4) for a desired number of rows.

(b) In Tuck knitting, Tuck slip stitches and weaving

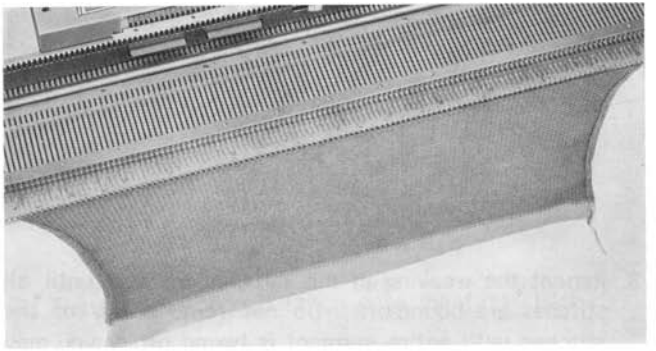


The needles placed in D position are worked gradually while knitting same as for stockinet knitting. However, in these cases push back the needles to be increased to B position using a transfer tool.

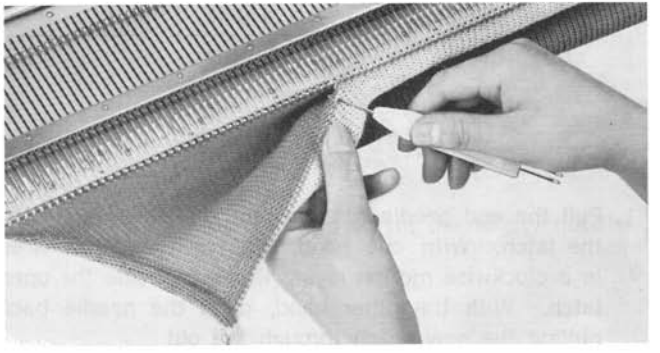
(The same method for Tuck knitting can be used for Lace knitting and Two thread knitting.)



(D) Hemming a garment



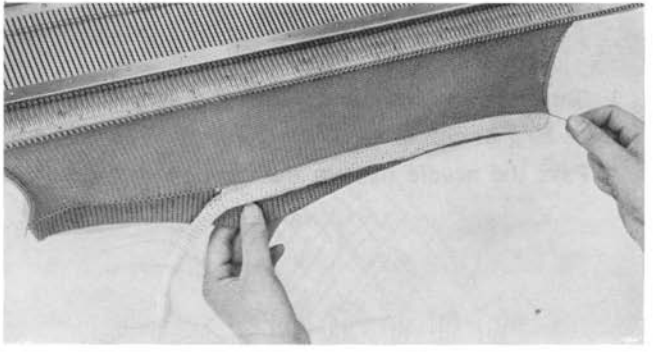
Using desired number of needles and a scrap wool, cast on and knit several rows of waste knitting. Knit one row with a raveling cord. Then, tighten the tension by one full number and knit double the length of the hem. Make it double by putting the stitches on the first row to the corresponding needles. Then, loosen the tension by 2 numbers and knit one row to close the hem.



Adjust tension and continue to knit.

To seal the hem, follow the steps listed below.

(1) Using one-eye transfer tool, pick up the stitches of the first row of main yarn, one by one, and put onto the hook of the needles.

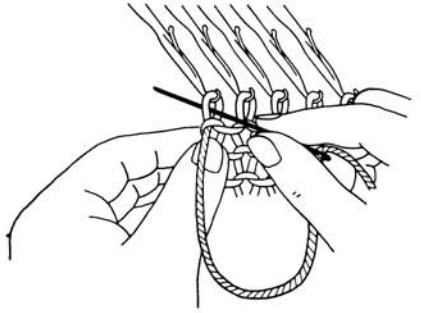


(2) After the hem is closed reset the row counter to 0. Reset the tension to garment tension and continue knitting.

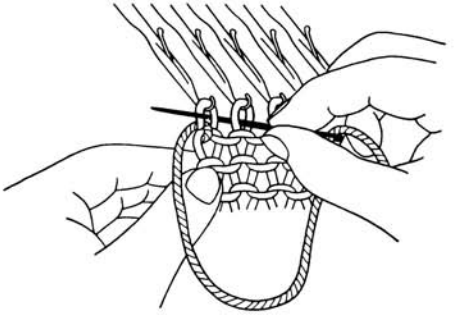
(Note) After a few rows have been knit in the main body, undo each edge stitch of the raveling cord, and pull it off. The waste knitting will fall free, revealing a neat, smoothly finished hem.

(E) Binding off

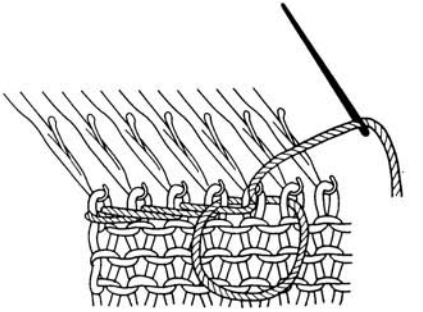
(a) Binding off with a tapestry needle



1 Thread a tapestry needle with the yarn three times as long as the width of the garment to be bound off. Pass the needle through the edge stitch from front.

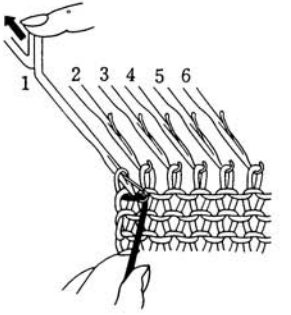


2. Insert the needle through the front of the second stitch and around into the back of the first stitch. Pull the yarn through both. Avoid pulling too tightly.

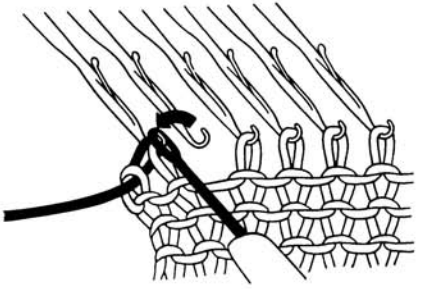


3. Repeat the weaving in this circular method until all stitches are bound-off. Do not remove any of the stitches until entire garment is bound off or you may have stretched stitches.

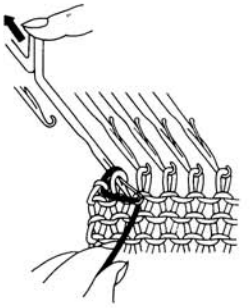
(b) Double stitch bind off
(Start on the carriage side.)



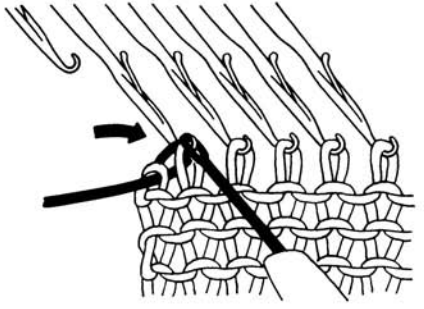
1. Pull the end needle forward until the loop is behind the latch. With one hand, hold the yarn and wrap in a clockwise motion laying the yarn inside the open latch. With the other hand, push the needle back pulling the new stitch through the old



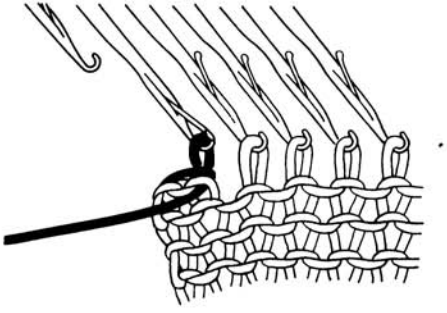
2. Transfer the second stitch onto the first stitch.



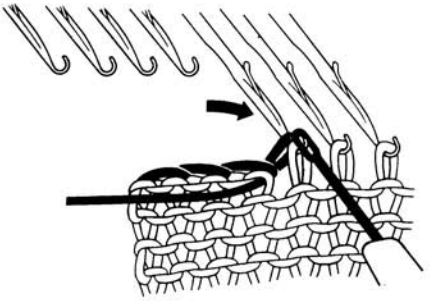
3. Pull the needle forward. Again wrap around the yarn in clockwise motion laying it inside the latch.



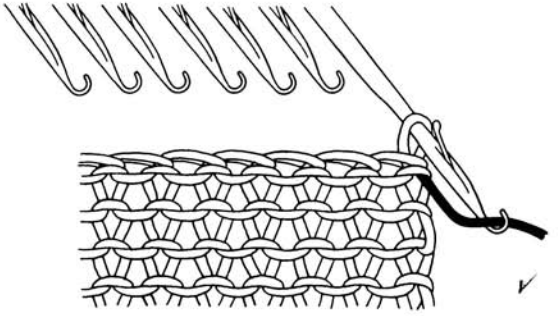
Move this double stitch in to fill the empty needle.



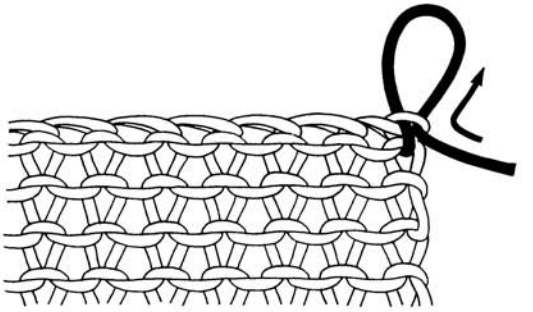
Push back, knitting a stitch.



4. Continue in this manner until all stitches are bound off except the last one.



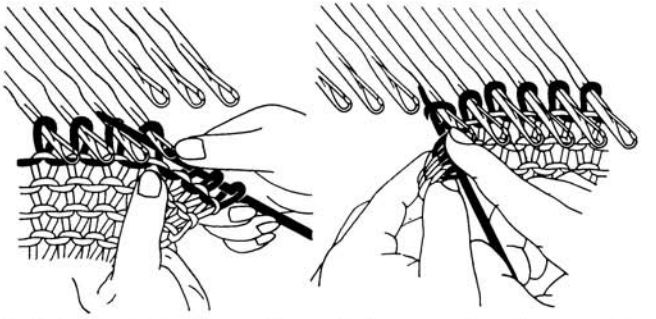
5. When the last stitch is reached, pull the needle forword until the last loop is behind the latch. Lay the yarn in the hook.
Knit in. One stitch is left. Leaving the yarn as required for seaming or weaving, cut the yarn.



6. Push the needle back to A position streching the stitch. Remove from the machine. Run the end of the yarn through the loop and pull the end stitch in firmly.

(F) Removing the garment from the machine

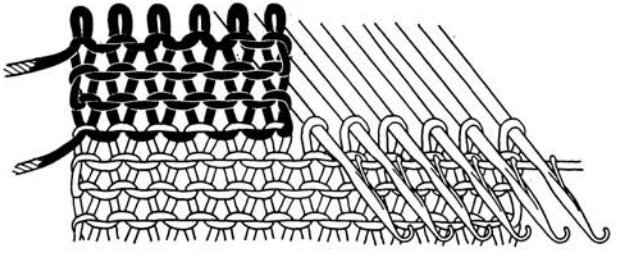
(a) Using a hand knitting needle



Pull forward to D position all the needles from which the stitches are to be removed. * Hold the garment with your left hand. With a hand knitting needle in your right

hand, go in through back of the first stitch. Push the needle up through the stitch about 1/2 inch. With the thumb of your hand, push the latch needle back and slip the first stitch off. Hold the stitch now on the hand knitting needle down with the thumb. Repeat from * until all stitches are removed from the machine.

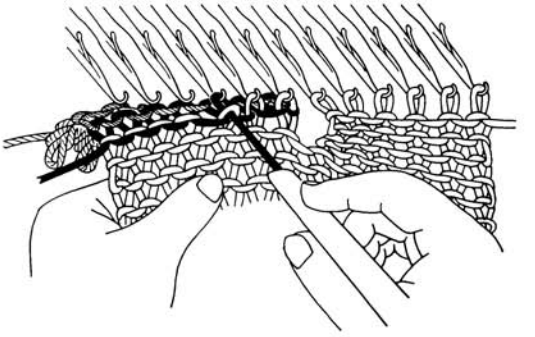
Note: You can also remove the stitches starting from the left side of the garment by inserting the hand knitting needle in through the front of the stitch and catching the side of the stitch. Push the needle back with the forefinger removing the stitch.



(b) Using waste knitting

After you have finished knitting, knit 8 to 10 rows with scrap yarn. Then remove from the machine. The scrap yarn can be unraveled after weaving or binding off is completed.

If you are going to knit partially on one section of your garment at a time, it is convenient to knit several rows of waste knitting on the portion to be rested.

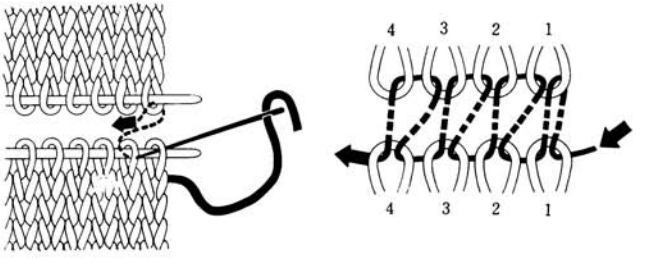


Then remove from the machine. This portion can be put back on the machine when you are ready to knit on it.

(G) Weaving (Grafting)

(a) Weaving stockinet stitches

1. Lay two pieces of stockinet knitting closely together. The stitches are on hand knitting needles or knit-off on a scrap yarn. The knitting yarn for the tapestry needle is three times as long as the width of garment.

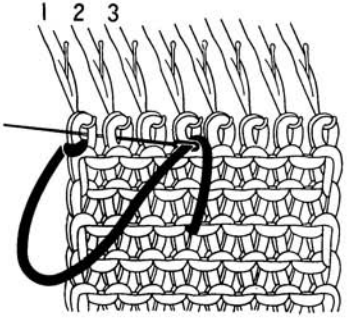


2. Insert the needle into the first stitch from the wrong side of the lower piece and pull yarn. Next, insert the needle into the first stitch of the upper piece of knitting from the wrong side. Pull the yarn.

3. Once again the tapestry needle is inserted through the first stitch from right side on the lower piece. Continue to run the needle across, under and up the second stitch on the lower piece. Pull the yarn.

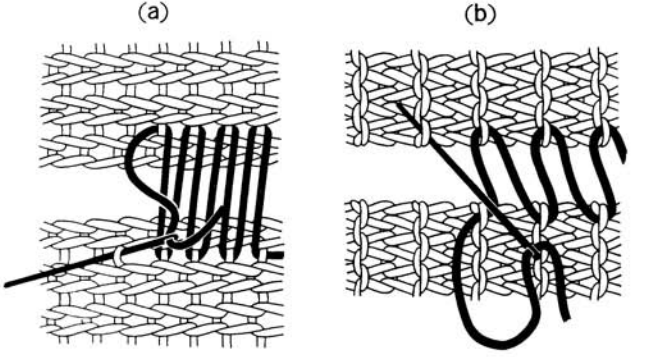
4. For the second time insert the needle into the first stitch on the top piece. Repeat this procedure until the two pieces are perfectly woven.

(b) Seaming on machine needles



The seam will be more firm if you use the machine needles. It is an excellent way to seam shoulders. Place the two pieces of knitting to be seamed on the machine needles the right sides in. Knit one row with the carriage from right to left. Unthread and break the knitting yarn leaving three times the length of the seam. Thread the tapestry needle with it and bind off, as illustrated on page 58.

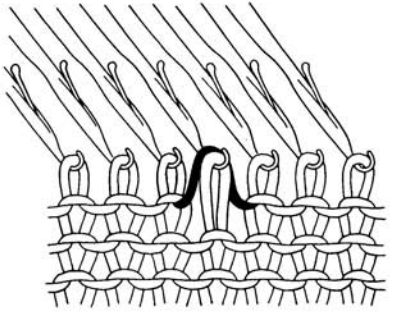
(H) Seaming side edges



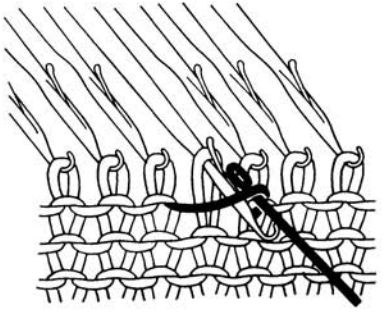
Thread the tapestry needle with the yarn double the length of the side edges to be seamed. Bring the two pieces to be joined closely together. Weave each edge stitch on both pieces by passing the needle through the inside loop of every row. Join the edges neatly. Figure (b) shows how to seam gartered side edges.

(I) How to fix dropped stitches

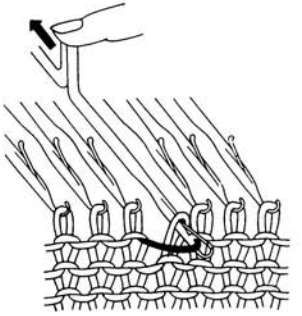
(a) Correcting a dropped stitch

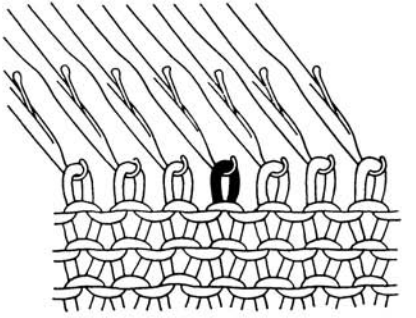


1. Insert the one eye tool into the stitch just under the dropped stitch Place the stitch together with the ioose yarn onto the needle.



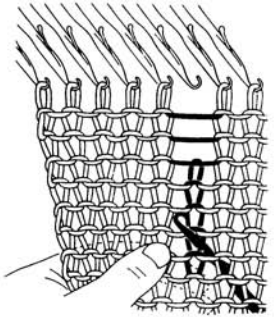
2. As you pull out the needle, place the stitch behind the latch leaving the loose yarn in the hook.





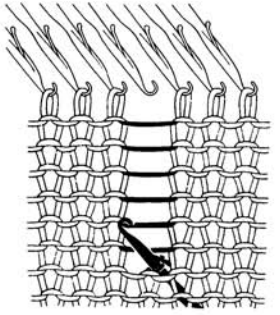
3. Push the needle back so that the stitch behind the latch slides over the closed latch, and reforms the dropped stitch.

(b) Correcting several rows of dropped stitches

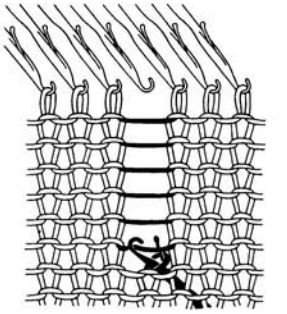


1. Insert the tappet into the side of the garment away from you, and catch a loop or stitch a few rows below the dropped stitch. Undo the stitches down to the tappet.

Note: With free hand pull down on the garment directly under the dropped stitch. This separates the cross threads and makes picking up easier.

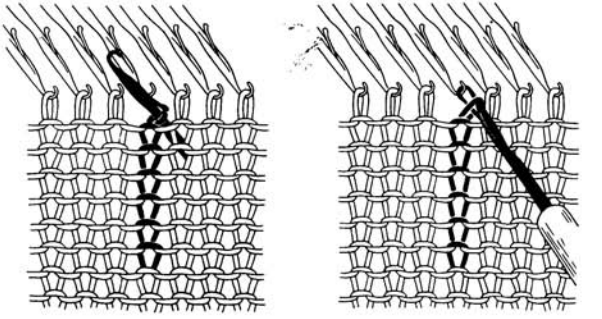


2. Push the tappet toward you so that the stitch comes behind the latch of the tappet and catches the cross thread just above into the hook.



3 Draw back the tappet, and cross thread is trapped in the closed latch.

The stitch behind the latch slides down over the closed latch to form a stitch.



Repeat this procedure to the top.

4. Pull the last stitch rather tight. Carefully remove the stitch from the tappet and place it on the needle with your tappet from the front.

7. LET'S KNIT

For your first step practice, the following two articles are recommended to be knit in stockinet stitches. After you have knitted one or two garments you will be able to knit in pattern stitches using Punched Card.

(A) Bed Room Slippers

—Material—

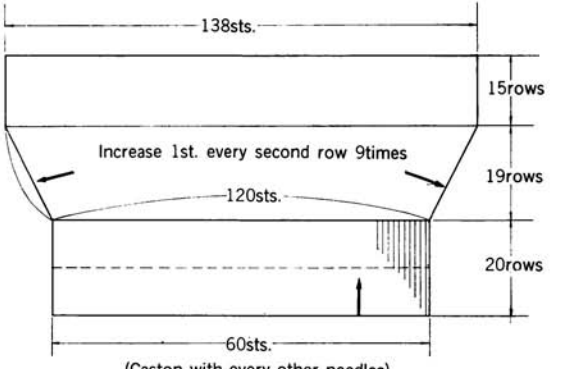
Medium size yarn..2 ozs

Elastic..... ...20 in

—Gauge—

1 in. square=
8 stitche × 11 rows

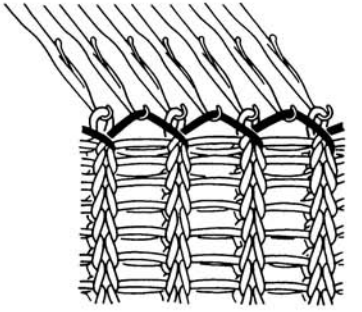
(4 in. square=
32 stitches × 44 rows)



(Caston with every other needles)

(1) Pull out 120 needles. (60 needles on each side of 0) With the needle pusher push back to A position every other needle, beginning with the second needle from the end. Pull the other needles still in operation out to D position. Cast on following the directions on page 14.

(2) Set the tension dial to 3. With Russel Lever in CENTER position knit 20 rows.

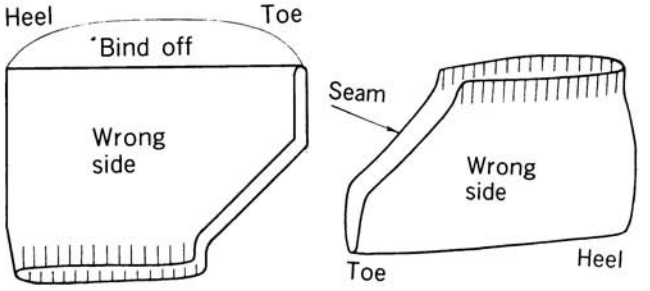


(3) Pull out to B position the 60 needles that were pushed back to A position. Place each stitch of the starting row onto each of the 60 empty needles, to form hem. Now 120 stitches are on the machine.

(4) Reset the tension dial to 5 and knit one row.

(5) Shape instep by increasing one stitch on each side every second row 9 times. The last of increases are to be made on the 18th row. (139 stitches are on machine.)

(6) Knit 15 rows without increasing or decreasing. Then knit 5 rows with waste yarn and remove the knitting from the machine.

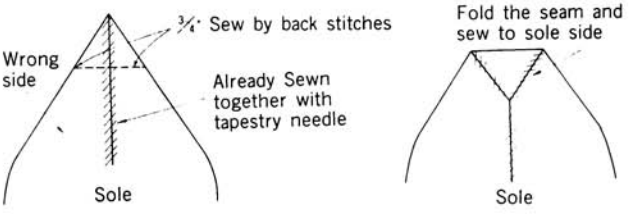


(7) Fold the work with the right side together. With toe portion on the right side, place the two stitches of the last row of the folded garment onto each of 69 needles. Undo the waste knitting part.

(8) Knit one row with the carriage from right to left.

(9) Measure the yarn three times the width of the garment and cut. Bind off the stitches with the tapestry needle and remove from machine.

(10) Seam the instep portion to form the toe.



(11) Seam approximately 3/4 in. of the heel portion from the wrong side. Fold over and sew to sole side.

(12) Pass elastic through the doubled portion of the top. One of a pair is completed.

(13) Complete the other in the same manner.

Pom-Pom: Wrap around wool 90~100 times around a cardboard of 2¼ in. (5.5 cm) or three fingers. Remove it in shape. Cut the both ends and tie the strands at the middle using a strong cotton thread. Trim round and attach in front of the slipper.

(B) PULLOVER FOR 5~6 YEAR GIRL

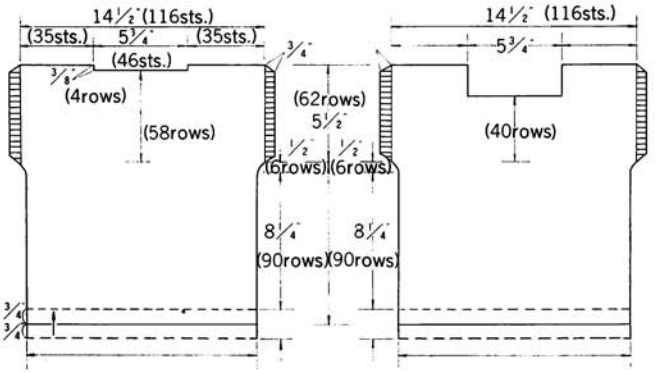
Measurements:

Width all around under arm: 27 ins.
Length of pullover = 15 ins.

Materials: Medium (4-ply) size wool: 5½ ozs.

Gauge: 1 in. = 8 stitches & 11 rows
(4 ins. = 32 stitches & 44 rows)

Tension Dial = Around 5



(a) Back of sweater

(1) Pull out 110 needles to D position and cast on by winding on all 110 needles from left to right.

(2) Set the tension dial to 5. Set Russel lever to RIGHT (Red) and knit 19 rows.

(3) Place each stitch picked up from the cast-on row onto the needles. You will now have two stitches on each needle.

(4) Reset the tension dial to 7 and knit one row.

(5) Reset the tension dial to 5 and knit 90 rows.

(6) Knit 6 rows Increasing one stitch every second row three times on both sides. Now 116 stitches are on the machine.

(7) Knit 58 rows without increasing or decresing.

(8) Retain 35 needles from the carriage side (left-hand side) for the shoulder at B position and pull out all of the other needles to D position. Set Russel lever to CENTER and knit 4 rows with 35 needles at B position for the left shouder.

(9) Cut the yarn, leaving approximately six times the width of shoulder. Knit several rows of scrap yarn. Remove the 35 stitches from the machine. Push back the empty needles to A position.

(10) Push back the 35 needles at the opposite side (right-hand side) into C position leaving 46 stitches for Neck Opening in D position. Knit 4 rows and remove from the machine in the same manner as the other shoulder. (Refer to paragraph 9.)

(11) Push back the remaining 46 needles from D position to C position. Knit several rows with scrap yarn and remove from the machine.

(b) Front of sweater

(12) Repeat operation 1～6.

(13) Knit 40 rows without increasing or decreasing.

(14) Retain the 35 needles for the shoulder at the carriage side (left hand side) at B position. Pull out all of the other needles to D position. Set Russel lever to CENTER and knit 22 rows with the 35 needles at B position.

(15) Cut the yarn, leaving 2～2½ in. Knit several rows with scrap yarn and remove from the machine Push back empty needles to A position.

(16) Push back the 35 needles at opposite side (right hand side) into C position. Set the side lever to ▼, and knit 22 rows. Knit sevsral rows with waste yarn and remove from the machine. (Same as the paragraph 15.)

(17) Push back all of the other 46 neeedles at the center of the needle bed into C position. Knit several rows of scrap yarn and remove from the machine.

(c) Finishing

(18) Place the back and front shoulder together, with right sides in. Place the double stitch (one from each piece) of one shoulder on the machine until all of the 35 stitches are on. Undo the waste knitting.

(19) Thread the carriage with the yarn hanging at the end of the work, and knit one row. Bind off the shoulder with the tapestry needle. Remove from the machine.

(20) Finish the other shoulder in the same way as the paragraphs (18) and (19). Remove from the machine.

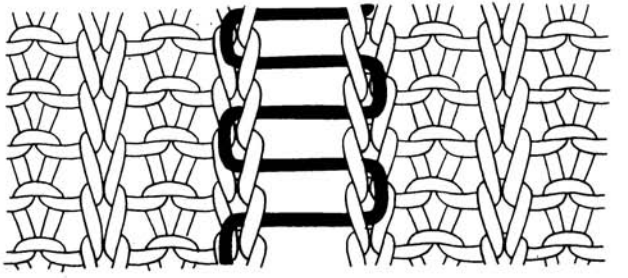
(21) For the sleeve band;

Pull out 87 needles into B position. With the wrong side towards you, place the loop picked up from each side of the shoulder seam onto the center two needles and the last edge stitch increased onto each end needle. Pick up the stitches evenly spaced from each side.

(22) Reset the tension dial to 4, and knit across from left to right. Knit 7 more rows. Purl every other stitch for ribbing. Cut the yarn, leaving three times the length of the width of sleeve band on machine. The yarn is on the left side of the needle bed.

(23) Transfer the stitches onto a hand knitting needle. Finish the stitches by rib binding, or by winding method.

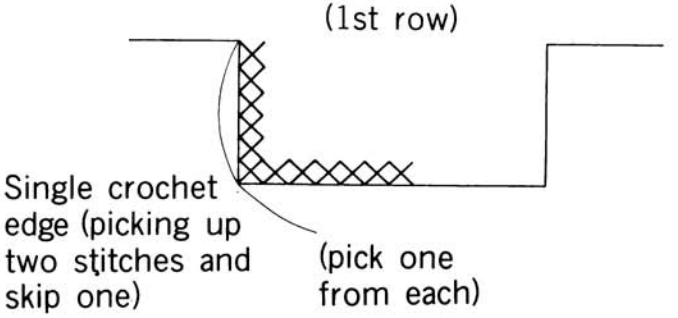
(24) Finish the other sleeve band in the same way as the paragraphs (21), (22) and (23).

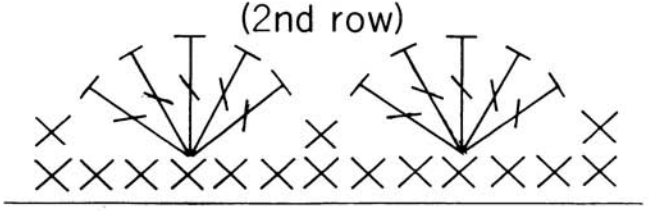


(25) Seam together the edges of the ribbed sleeve band, holding the wrong sides together and weave as shown above.

(26) Weave side seams together as shown on page 62.

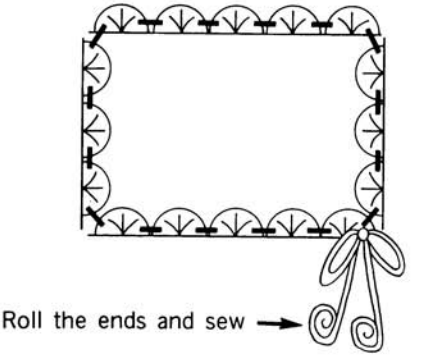
(d) Finishing of Neck Line





Shell stitches

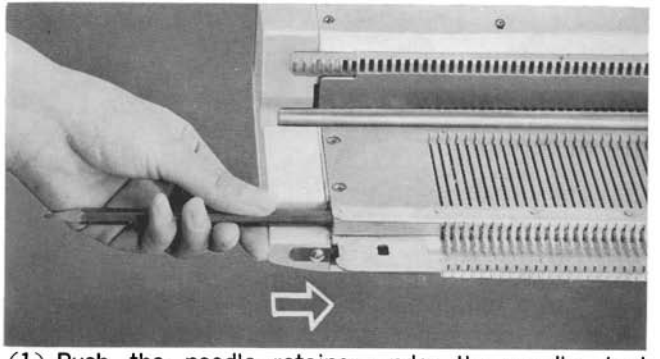
(27) Work one row of single crochet around the neck line, then the second row in shell stitches of five double crochets for nice finishing.



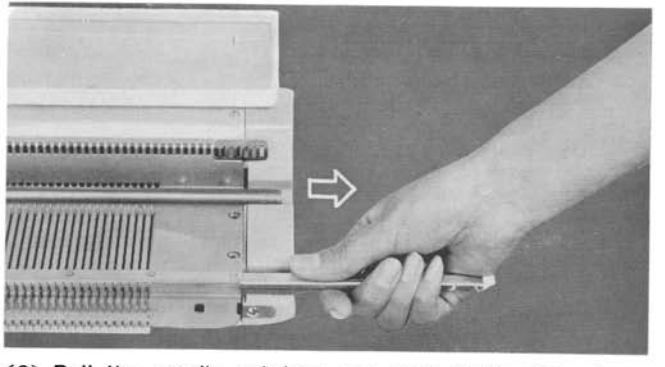
(28) Knit a cord of three stitches as shown on page 48, and as long as 48 ins.
Pull the cord through each shell. Curl the ends and stitch together. Tie in a small bow.

8. HELPFUL HINTS

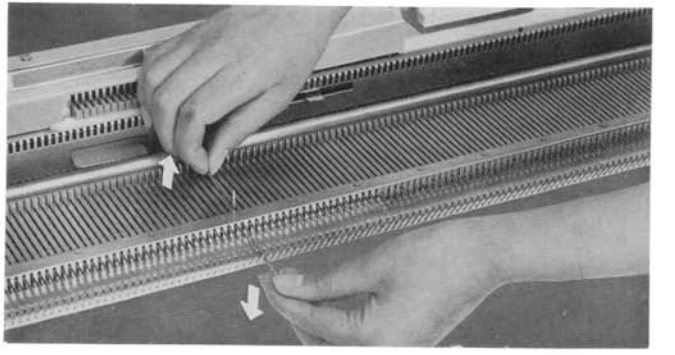
Replacing Damaged Needle



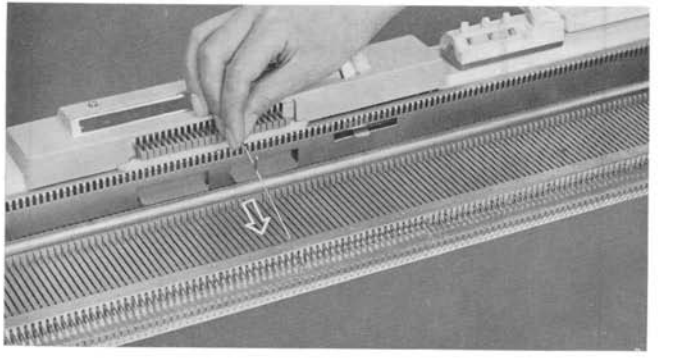
(1) Push the needle retainer under the needle bed out in either direction, using a pencil or a screw driver.



(2) Pull the needle retainer out until it is clear from the needle to be replaced.



(3) Pull the damaged needle to the D position. Push the hook downward and the shank will come out of the needle bed. Pull the needle off the needle bed by lifting the shank upward.



(4) To install a new needle in the needle bed, hold the butt in fingers and slip the needle in, latch end first, reversing the order in (3). And push the needle retainer back into its former position.

(A) Slacken or Pulled Yarn at the Beginning of Row

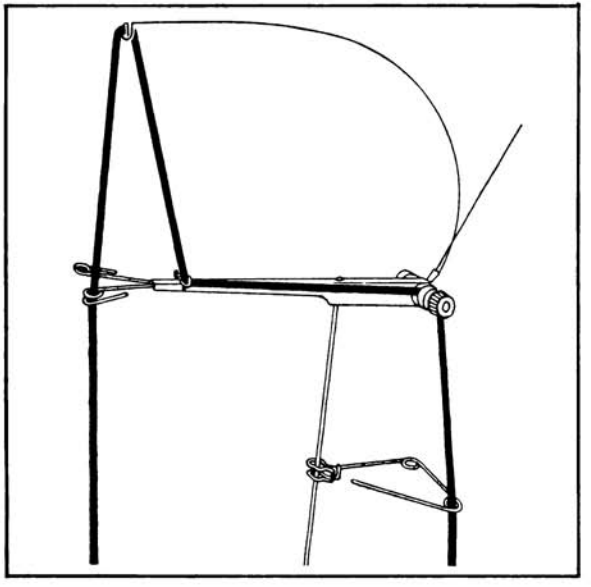
* Loose Yarn

Check to see that the yarn is correctly threaded through the auto-tension.

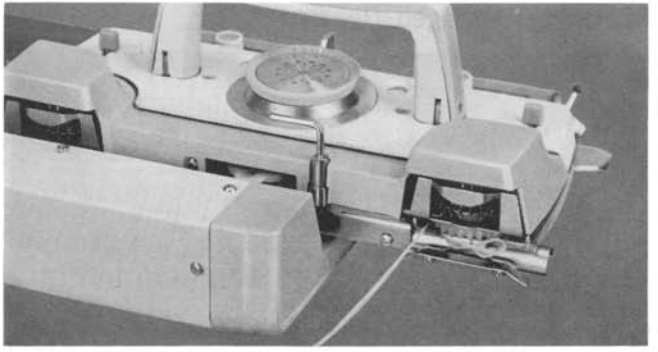
* Entangled Yarn

If the yarn got stuck in any part of the machine, it will impair the proper operation of the machine.

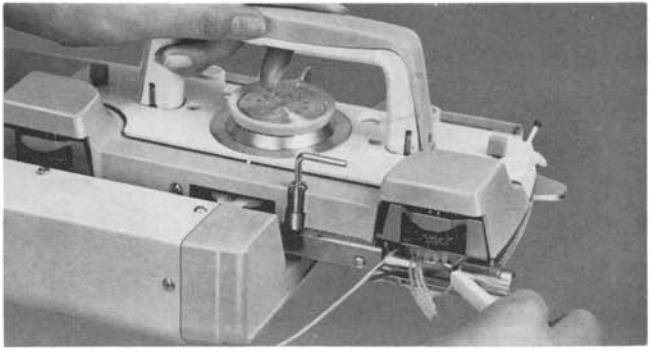
The yarn must be placed clear of the machine while it is operated to prevent such a mishap.



(B) The Yarn Getting Entangled in the "Artificial Brain"



(1) When the yarn has gotten entangled on the gear wheel of the "artificial brain", shift the carriage to the side of the machine as shown in the above figure.

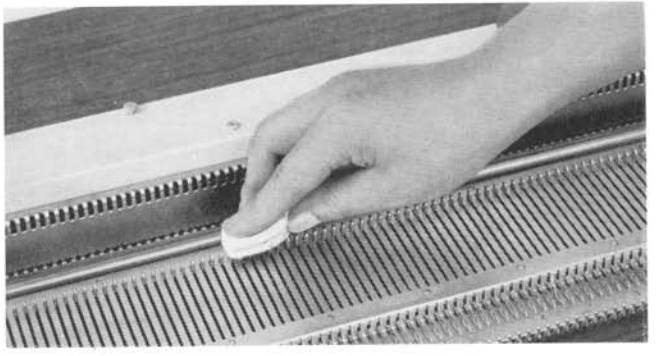


(2) Carefully disentangle the yarn, using the tappet.

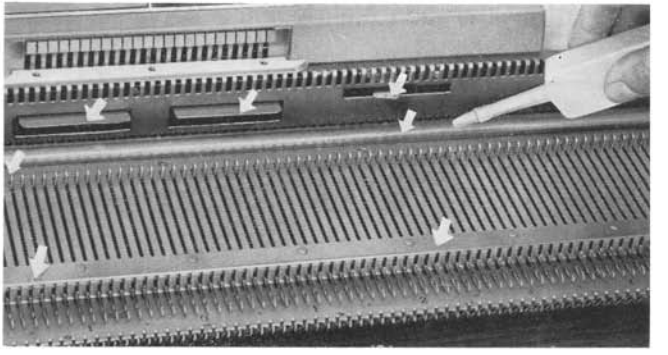
9. MAINTENANCE INSTRUCTIONS

Any kind of machine needs proper cleaning and lubrication, if it is to have a long usable life. Make sure that this knitting machine is always kept clean and well lubricated if you want to use it in good working condition for a long time.

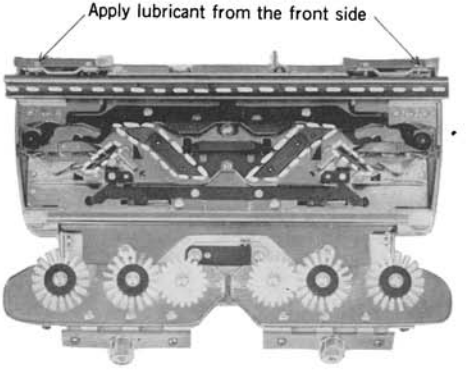
(A) Lubrication



(1) Wipe the butts of the needles with a piece of oiled cloth.

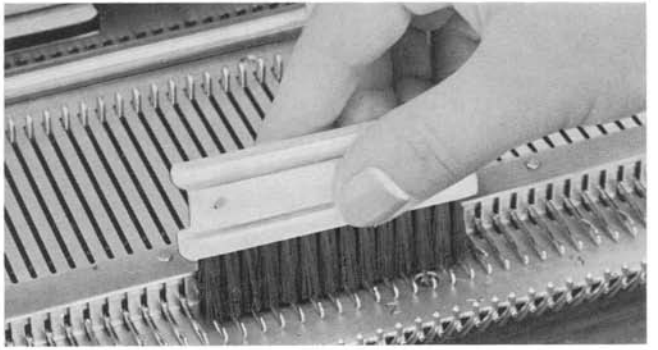


(2) Apply the lubricant drop by drop to the places marked with arrows. Move the carriage back and forth several times and the oil will spread all over the needle bed.



(3) Wipe the parts indicated by dotted lines with a piece of oiled cloth.

(B) After-Operation Maintenance Services



(1) Brush off wool dust from all parts of the machine.

(2) Carefully wipe off all the metal parts with an oiled cloth to remove dust and dirt.

(C) Cleaning of the Case

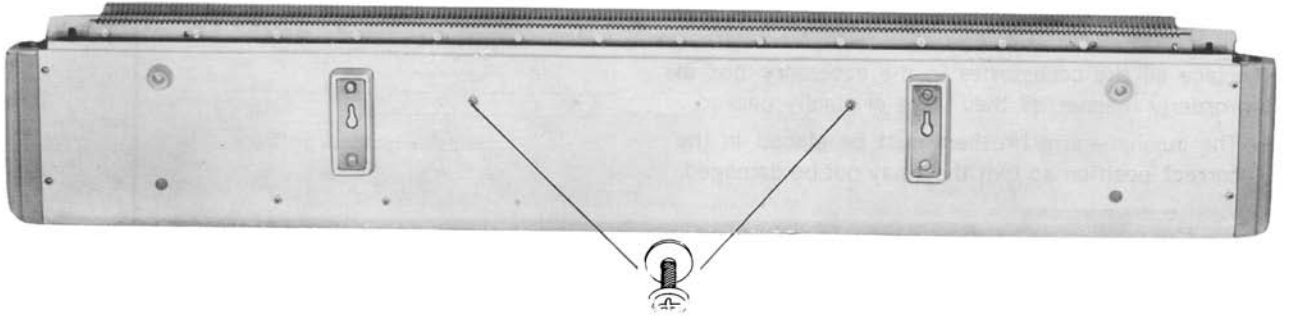
The case can be made clean by wiping with a piece of cloth saturated with synthetic detergent.

(D) Storage

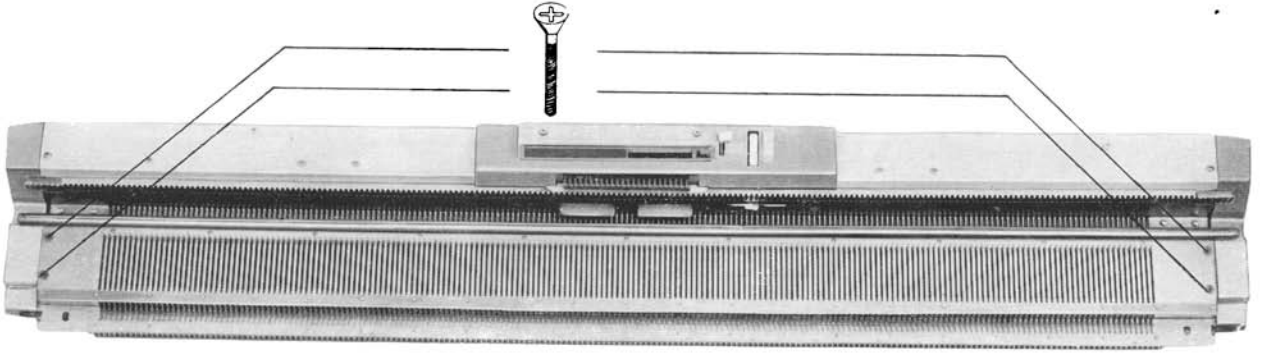
After being carefully cleaned, store the machine in a dry place.

(E) Method for Detaching the Knitting Machine Body From the Case

(1) Turn the machine upside down and remove the two screws located between the rubber feet on the backside of the case.



2) Remove the four screws holding down the needle bed and the needle bed will readily come off the case.



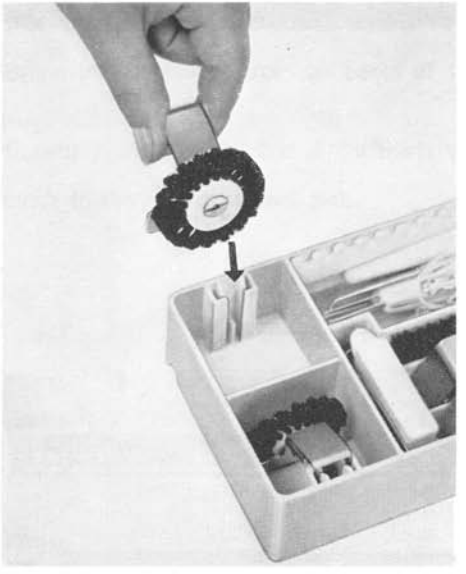
TO HOW TO PACK THE MACHINE AWAY

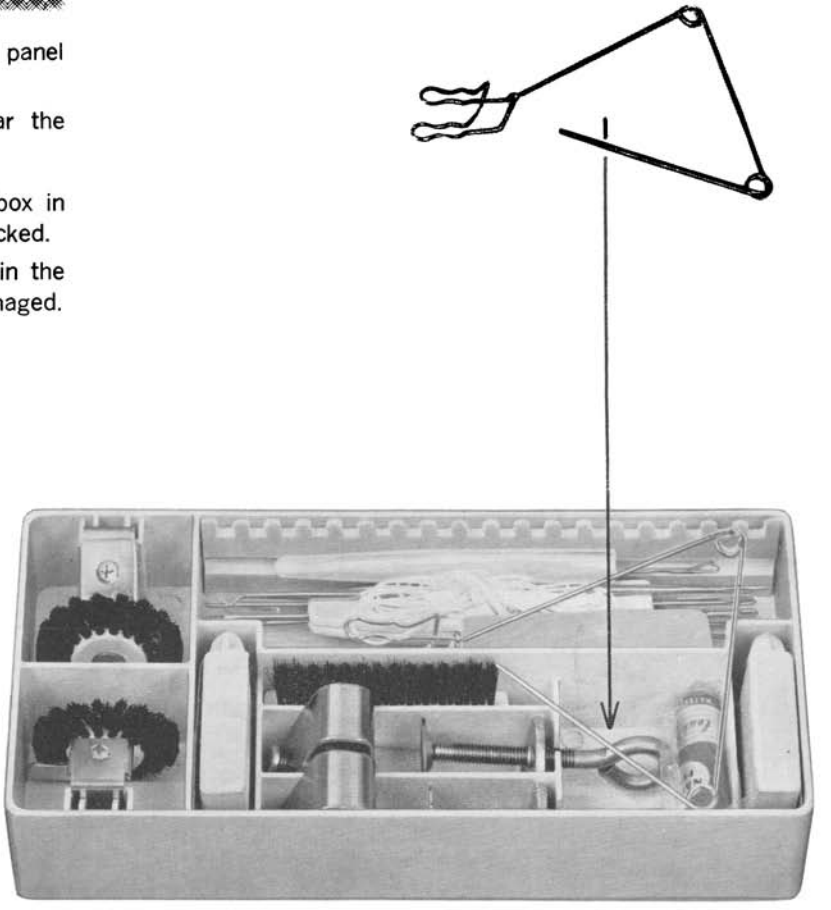
(1) Remove the punched card from the pattern panel while turning the feed dial.

* Special care is needed not to fold or tear the card.

(2) Replace all the accessories in the accessory box in an orderly manner as they were originally packed.

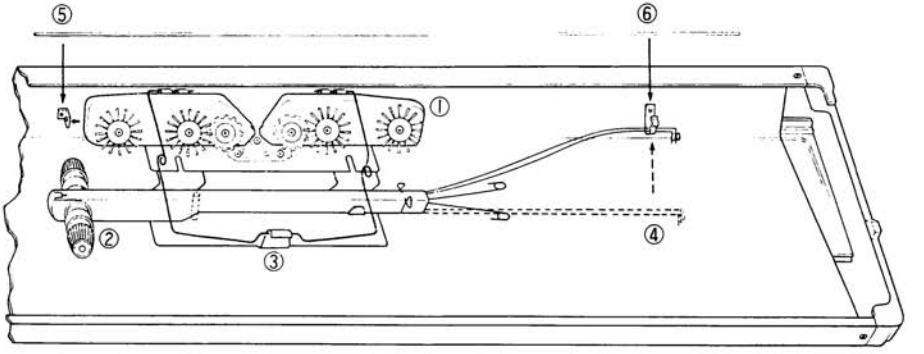
* The auxiliary arm brushes must be placed in the correct position so that they may not be damaged.



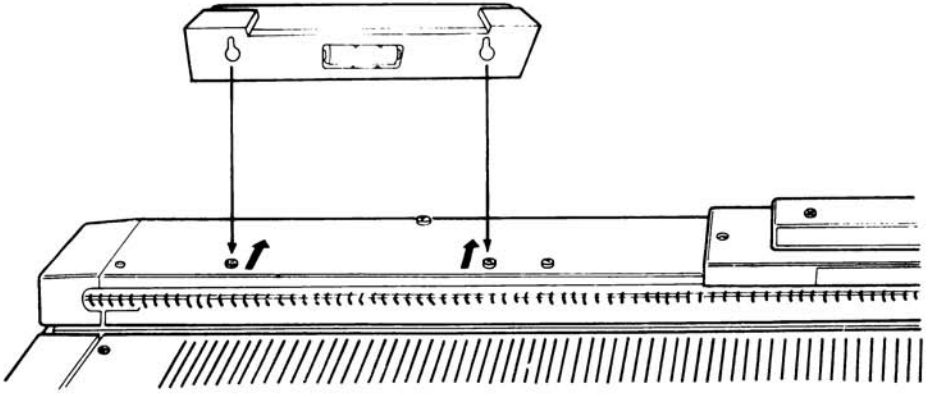


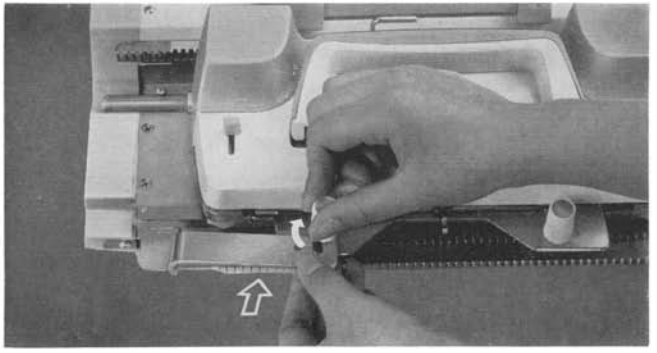
(3) Restore the arm, auto-tension and yarn rod orderly inside the cover of machine.

* Put them in the order (1), (2), (3), (4), (5), (6) as shown in the figure.

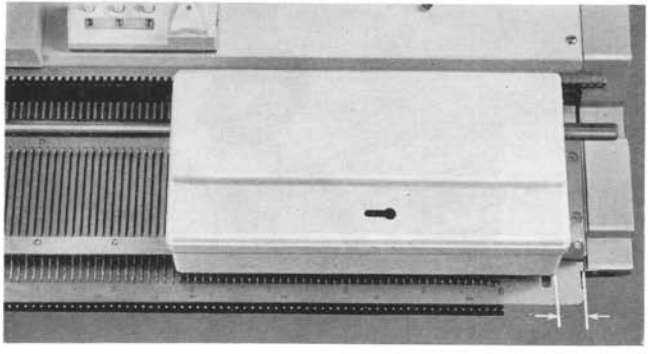


(4) Remove STOP Buzzer from the top of pattern panel and set it in at the left side of the back of machine.

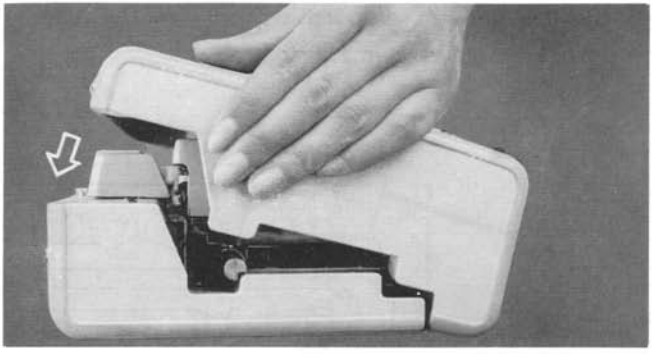




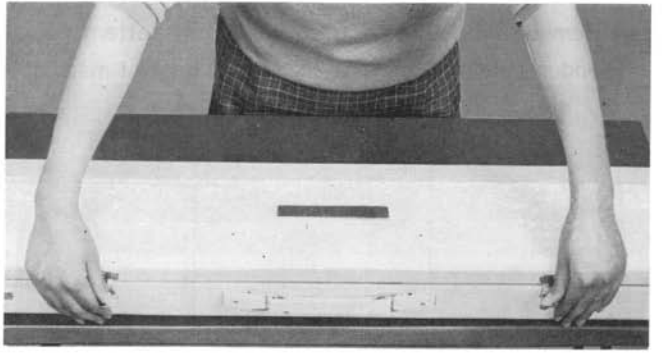
(4) Replace the carriage fastener to lock the carriage securely and fold the handle of the carriage.



(5) Place the accessory box on the needle bed so that it will be about one inch clear of the right end of the needle bed.



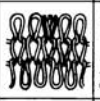
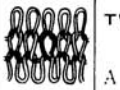
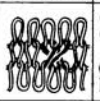
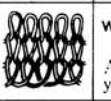
(6) Replace the cover.



(7) Fasten the latches.

11. KNITTING SYMBOLS

The following set of symbols has been adopted to help you understand your patterns at a glance and to save countless lines of description for each stitch.

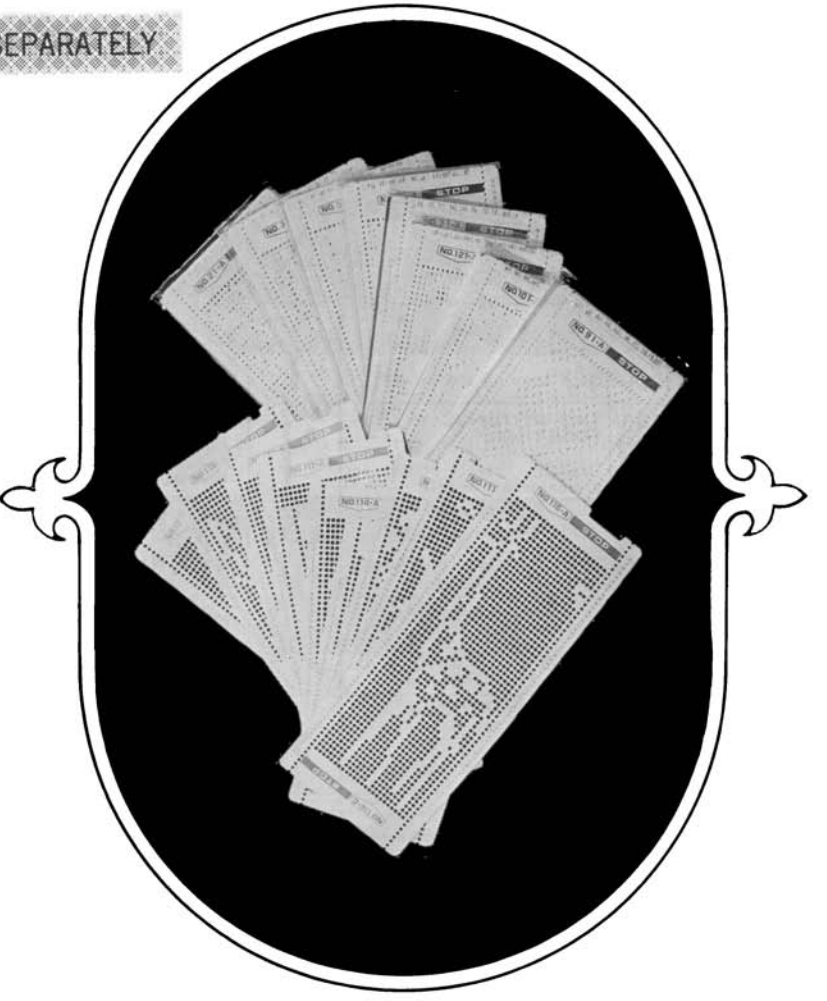
		KNIT STITCH Face loop of stockinet			**LEAN STITCH TO THE LEFT** Transfer the stitch to the left			**TUCK STITCH** A few loops on marked rows pulled up onto one needle
		PURL STITCH Back loop of stockinet			**INCREASED STITCH TO THE RIGHT** Increase one stitch to the right			**TUCK STITCH IN SIDE WAY TO THE RIGHT** A few loops on marked rows pulled up in sideway onto a right needle
		TWO STITCHES TOGETHER Transfer right stitch to adjacent left needle			**INCREASED STITCH TO THE LEFT** Increase one stitch to the left			**TUCK STITCH IN SIDE WAY TO THE LEFT** A few loops on marked rows pulled up in sideway onto a left needle
		TWO STITCHES TOGETHER Transfer left stitch to adjacent right needle			**THREE STITCHES INCREASED** Increased three stitches out of one stitch			**TWISTED TUCK STITCH** A stitch twisted and pulled up onto a needle above
		THREE STITCHES TOGETHER Center stitch on top of the left and right stitches			**CROSSING, RIGHT OVER LEFT** Cross the stitches with the right stitch over the left			**TWISTED STITCH** A stitch is twisted
		THREE STITCHES TOGETHER Right stitch on top			**CROSSING, LEFT OVER RIGHT** Cross the stitches with the left stitch over the right			**WINDING STITCH** A loop formed by winding yarn around a needle
		THREE STITCHES TOGETHER Left stitch on top			**SLIP STITCH** A loop marked is pulled up with yarn across behind it			**HOLE** Hole made by transfer ring the stitch to the next needle
		LEAN STITCH TO THE RIGHT Transfer the stitch to the right			**FLOAT STITCH** A loop marked is pulled up with yarn across in the front			

SERIES OF PUNCHED CARDS FOR SALE SEPARATELY

To give you a broader selection of punched cards to choose from there has been eleven series placed on sale. Each series contains ten punched cards.

Series are classified into those of solid pattern, colored pattern, etc., respectively representing the series. Besides these representative patterns, each series includes other types of knitting too.

Series No. 21 ..... Solid patterns
Series No. 22 ..... Colored patterns
Series No. 23 ..... Lace knitting
Series No. 24 ..... Knit-in, large patterns
Series No. 25 ..... Knit-in, large patterns
Series No. 26 ..... Knit-in, large patterns
Series No. 27 ..... Knit-in, small patterns
Series No. 28 ..... Weaving, large patterns
Series No. 29 ..... Weaving, small patterns
Series No. 30 ..... Knit-in, special patterns
Series No. 31 ..... Knit-in, special patterns



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